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## **Ambivalence in adolescents' alcohol expectancies: A longitudinal mixed methods study among 12-to-18-year-olds**

### **Abstract**

Drawing on the framework of alcohol expectancies and their importance for drinking behaviors, this longitudinal mixed-methods study examined changes and continuities in development of alcohol expectancies during adolescence. Quantitative and qualitative data were prospectively collected at four time points between 2015-2020 from nationwide, socio-economic, and gender-balanced samples of Norwegian adolescents aged 12-18. Quantitative data (n=3425) were analyzed using linear mixed-effects models, and qualitative data (n<sub>TI</sub>=118) using thematic analysis. Quantitative and qualitative results were juxtaposed in the discussion. Quantitative results indicated an increase in social facilitation and tension reduction expectancies from age 13 to 18, and a simultaneous decrease in negative emotional expectancies. This development could partly be explained by experience with alcohol use in adolescence. Similarly, qualitative findings showed adolescents' expectancies of alcohol evolving with age; from one-sided negative expectancies of aggression and harm to increased positive expectancies of fun, sociability, and relaxation. Both analyses showed that negative expectancies remained high throughout the study period, but by late adolescence, many participants held positive and negative expectations simultaneously. The qualitative data illustrated how adolescents' alcohol expectancies became increasingly ambivalent and complex with age, as alcohol use became more common. Prevention strategies aiming to reduce underage alcohol use should acknowledge this complexity.

Keywords: alcohol, expectancies, adolescence, ambivalence, mixed methods.

## **Introduction**

Adolescence is an important period of biological and psychosocial maturation and cognitive development. The onset of puberty, usually around the ages of 10 to 12, brings about developmental changes resulting in increased impulsivity (Romer et al., 2011). Adolescent's sensitivity to rewards and threats and tendency to seek novel experiences also increase (Tymula et al., 2012, Cserwenka et al., 2013), and this process continues through mid- (ages 13-14) and late adolescence (ages 16-18). Adolescence is characterized by greater autonomy from parents and by increasing importance of peers' influence and social status (Laursen & Veenstra, 2021). It is also a crucial period for identity development and for understanding oneself and one's place and agency in the world (Harter, 2012). The increase in willingness to take risk and the salience of social status during adolescence are all propensities that are necessary for exploring new social environments and building new relationships outside the family. However, this development also imply exposure to many risks, such as risk of violence, harm to self or others, or social exclusion (Tymula et al., 2012). This life phase has also been identified in a number of studies as an important transition period concerning one's expectancies and beliefs about alcohol (see e.g Jones & Gordon, 2017, Smit et al., 2018, Pinquart & Borgolte, 2022 for a review of studies).

For many young people, experimenting with alcohol is an activity that affirms social relationships (MacLean, 2016) and contribute to pleasure (Fry, 2011). It can also be a means to display maturity and autonomy (Rolando et al., 2014) and to explore new identities (Ander et al., 2017, Buvik et al., 2021). At the same time, parents tend to disapprove of adolescent drinking (De Looze et al., 2014, Raitasalo et al., 2018) and adolescent drinking is often portrayed as problematic in public and political discourses (Johnson & Milani, 2010, Azar et al., 2014). Young people have long been the focus of alcohol policies, both in terms of specific interventions (e.g., minimum legal drinking age) and via broader policies like price

interventions (Babor et al., 2010), given that adolescent alcohol use contributes to both short- and long-term negative health outcomes (Mokdad et al., 2016).

As adolescents mature, they become increasingly exposed to opposing signals about alcohol. The potential of attracting positive and repelling negative consequences from alcohol consumption (Room, 1976) can lead to complex expectations and decision-making regarding alcohol (Breiner et al., 1999). Research approaches that allow for complexity and ambivalence in young people's evolving perceptions of alcohol use and consider the social and cultural context in which these develop is thus important.

### *Alcohol expectancies*

Alcohol expectancies are perceptions that particular behavioral, emotional, social, or cognitive outcomes will be experienced by oneself or others when drinking alcohol (Jones et al., 2001, Leigh & Stacy, 2004). Expectancies of alcohol use may include positive social expectations of conviviality or feeling more confident, expectations of mood alterations such as relaxation or tension reduction, and negative expectations of loss of control, risk, aggression and self-disapproval (Fromme et al., 1993, Smit et al., 2018). Alcohol expectancies start developing early in childhood, even long before adolescents start using alcohol (Kuntsche et al., 2016, Voogt et al., 2017). While positive alcohol expectancies have been found to increase with age, several studies have found that negative expectancies either remain stable over time (Cameron et al., 2003, Colder et al., 2014) or slightly diminish with age (Pinquart & Borgolte, 2022). Other important predictors of alcohol expectancies include both individual (e.g., alcohol-related cognitions, psychopathology and personality) and environmental factors such as family, peer and media influences (Jones & Gordon, 2017, Smit et al., 2018). Some studies have shown that men tend to hold stronger positive and weaker

negative alcohol expectancies than women (Jones et al., 2001, Nicolai et al., 2012), although this finding is not consistent (Jones & Gordon, 2017, Piquart & Bogolte, 2022).

Alcohol expectancies have been shown to impact alcohol use such that positive expectancies are important in the initiation and maintenance of alcohol use, while negative expectancies may be more important in the decision to avoid or delay drinking or to stop or moderate alcohol use after initiation (Settles et al., 2014, Colder et al., 2014). However, the direction of causation of the associations is less clear (Jester et al., 2015, Treloar Padovano et al., 2020, Smit et al., 2018). Alcohol expectancies have also been shown to act as a mediator between individual or environmental predictors and alcohol use, when factors directly related to alcohol use like gender or sociocultural environment affect expectancies that again affect alcohol use (Jones et al., 2001). For example, a recent study among ethnic minority youth in the USA (Zapolski & Clifton, 2019) showed that negative alcohol expectancies of becoming depressed, sad or angry if drinking acted as a mediator between parent's cultural socialization - emphasizing knowledge and pride for their culture - and less alcohol use.

#### *Norwegian drinking culture and adolescent alcohol use*

In Norway, the setting of the current study, alcohol policies are among the strictest in the world (Brand et al., 2007) and regulations on the availability of alcohol are mostly supported in the population (Storvoll et al., 2014). The traditional pattern of drinking in Norway has been characterized by low consumption on weekdays, but greater consumption taking place in binge-drinking sessions at weekends and during celebrations (Bye & Rossow, 2010).

Norwegian boys and girls drink alcohol at similar rates (Bakken, 2022) and they usually participate in the same social drinking situations (Vaadal & Ravn, 2021). Recent surveys show that any life history of alcohol intoxication was reported by about 25% of Norwegian adolescents in the last year of lower secondary school (ages 12-15); by about 50% in the first, and 80% in the last year of upper secondary school (ages 16-19) (Bakken, 2022). This is after

a marked decline in adolescent drinking has been observed in Norway over the past 15 to 20 years, as in many other Western countries (Livingston et al., 2016, Harding et al., 2016, Raitasalo et al., 2018, Pape et al., 2018). This development has been most noticeable among the youngest adolescents (De Looze et al., 2015). Several possible explanations for this development have been suggested, such as increased parental supervision and involvement in children's lives and changes in adolescents' lifestyle and leisure time activities (Kraus et al., 2020, Vashishtha et al., 2019, Törrönen et al., 2019, Halkjelsvik et al., 2021). Some researchers have interpreted the reduced drinking among younger adolescents as 'childhood lasting longer' (Twenge & Park, 2019), while others have argued that the social meaning of alcohol in youth cultures may have changed (Törrönen et al., 2019) and that non-drinking has become increasingly normalized (Caluzzi et al., 2022, Scheffels et al., 2021). These changes in drinking patterns may add complexities to the development of adolescents' perceptions and expectancies of alcohol.

Against this background, the current study combined quantitative and qualitative analytical methods to further our understanding of how alcohol expectancies develop in adolescence. First, we applied linear mixed-effects models to quantitative data to examine the typical development of alcohol expectancies from early to late adolescence in a large nationwide sample of Norwegian adolescents. Second, using repeated in-depth interviews with an accompanying sample of young Norwegians, we delved deeper and explored how expectancies of alcohol use were expressed by adolescents in their own words, and how this developed over time. Finally, the results obtained from quantitative and qualitative analyses were juxtaposed in the discussion to gain a broad understanding of how alcohol expectancies are expressed and develops throughout adolescence.

## Methods

We analyzed quantitative and qualitative data from the MyLife study, a nationwide longitudinal study on adolescence and substance use in Norway conducted by the Norwegian Institute of Public Health. Details about the study design and recruitment can be found in the MyLife Cohort Profile (Brunborg et al., 2019). The study received approval by the Norwegian Data Inspectorate (reference no.: 15/01495) after ethical evaluation by the National Committee for Research Ethics in the Social Sciences and the Humanities (reference no.: 2016/137).

### *Quantitative analyses.*

#### *Data.*

The goal of the sampling strategy was to ensure a geographically heterogeneous sample. We selected five counties from different geographical regions, and then drew municipalities stratified by urban and rural location, and low, medium and high standard of living within each county based on Statistic Norway's index for living conditions (Rogstad, 2002). The index is a combination of information about welfare recipients, mortality, and violent crime, and can be used to rank Norwegian municipalities. A total of 42 lower secondary schools (grades 8 to 10) were drawn at random and invited to participate. Nine schools declined, leaving 33 schools with a total of 6,951 lower secondary school students eligible for study participation. Parental consent was required, and parents of all students were asked to consent to study participation. Parental consent forms were returned for 4,195 students, and parents of 3,512 students consented.

All the 3,512 eligible students (55% girls) were invited to participate at each of four assessments: the fall semesters of 2017 (t1), 2018 (t2), 2019 (t3) and 2020 (t4). Students attending lower secondary school completed e-questionnaires during school time with teachers' supervision; students in upper secondary school received a link to the questionnaire

via text messages and completed the questionnaire in their spare time. Out of all those invited (3512 students), 85%, 81 %, 75% and 66% responded at t1-t4 respectively. The analytical sample for the study comprised 3,425 adolescents (55% girls) who completed at least one of the four annual assessments. The sample's distribution over all possible participation patterns is shown in Supplementary table 1.

### *Measures.*

Alcohol expectancies were measured with three subscales of the Alcohol Outcome Expectancies Scale (AOES) (Leigh & Stacy, 1993). The subscales were including the Social Facilitation Expectancies (6 items, e.g., "I will become more social"), Tension Reduction Expectancies (3 items, e.g., "I will feel less stressed"), and Negative Emotional Expectancies (3 items, e.g., "I will feel sad or depressed"). The questions were preceded by the statement "Here's a list of things that can happen to people when they drink alcohol. What do you think would happen to you if you drink alcohol?" Response options ranged from "Definitely not" (coded 1) to "Definitely" (coded 5). Mean scores for each subscale were used in the analysis. Cronbach's alpha was 0.88, 0.88 and 0.86 for the Social, Tension Reduction and Negative Emotional subscales respectively at T1. The full AOES has eight sub-scales, however only these three sub-scales were included because they were assumed to be the most relevant to study risk factors for adolescent alcohol use, and due to constraints on the number of items in the e-questionnaires.

Alcohol drinking frequency. Respondents were asked to indicate how often they had consumed alcohol in the last 12 months. The response options ranged from 0 ("Not at all") to 6 ("Every day or almost every day") and were used as a continuous variable in the analyses.

Age and gender. Participants' exact age was calculated by subtracting each participant's date of birth from each e-questionnaire's submission date. For anonymization purposes, this was

recoded to age in years with one decimal. Gender was determined by the national identity number; the ninth digit is an odd number for boys and an even number for girls.

Centrality. Each municipality's centrality was determined using Statistics Norway's centrality index (Høydal, 2017). C The centrality index is a composite of the number of workplaces and the number of different service function that residents on average can reach within 90 minutes' drive from home, adjusted for travel time.

### *Analyses.*

The normative developments in the three examined types of alcohol expectancies (i.e., Social Facilitation, Tension Reduction, and Negative Emotional) from age 13 to age 18 were estimated with linear mixed-effects models (Singer & Willett 2003). We exploited MyLife's accelerated longitudinal design, where three birth cohorts (i.e., lower secondary school grade levels) assessed at four annual assessments covered the ages 13-16, 14-17 and 15-18 respectively. This allows modelling the normative trajectories from age 13 to 18 (Duncan et al., 1996). We fitted two-level models using the "mixed" command in Stata 16 (Statacorp, 2019). The first level was age centered at 13 (coded 13 = 0, ...18 = 5), and individual was the second level of analysis. Random effects were estimated for within person residual variance, and between person variance in initial status and in linear rate of change, as well as the covariance between initial status and rate of change. The modelling strategy was the same for all three outcomes. No covariates were included in Model 1; the unadjusted effect of rate of change with age was estimated. In Model 2, fixed effects were added for gender (0 = female, 1 = male), cohort (8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> grade at t1), and centrality (coded 1 = most central ... 6 = least central) to estimate the effect of aging while controlling for potential demographic differences. In Model 3, we added alcohol drinking frequency as a time varying covariate to estimate the effect of aging also controlling for alcohol use. All analyses were performed using Stata 16 (Statacorp, 2019). No individuals were excluded due to missing values on



alcohol use. With the data in long format, Stata estimates the linear mixed-effects model parameters using all non-missing observations, without imputation of missing values. Under the assumption of missingness at random (MAR) this results in unbiased estimates.

### *Qualitative analyses.*

#### *Data.*

Six of the 33 schools taking part in the quantitative arm of the MyLife study were recruited to the qualitative strand of the study in 2015 with one 8<sup>th</sup> grade class each. Similar to the quantitative sample, the schools were selected in order to represent different geographical regions, urban and rural locations and community standard of living (Brunborg et al., 2019). Data for the current study consists of focus groups and interviews with this sample of adolescents at four time points: in lower secondary school; 8<sup>th</sup> grade (T1, age 12/13, N=118) and 10<sup>th</sup> grade (T2, ages 14/15, N=85 and T3 ages 15/16, N=95) and upper secondary school; 11<sup>th</sup> grade (T4, ages 16/17, N=80).

Initial data collection (age 12/13) was conducted as 26 focus group discussions interviews in the 2015 fall semester during regular school hours, lasting 45 minutes on average. The first round of follow-up (age 14/15) was conducted as 24 focus groups two years later, during the first semester of 10<sup>th</sup> grade. All focus group discussions were conducted in smaller groups (3-6 students with different compositions: all girl groups, all boy groups, and mixed gender groups). The third round of data collection (age 15/16) was individual interviews, performed during the second semester of 10<sup>th</sup> grade. The final round (age 16/17) was also individual interviews and it took place one year later, when the students were in their first year of upper secondary school. The individual interviews lasted approximately one hour. Similar, but age-adapted (for example more questions on perceptions of alcohol in early interviews and more on experiences later) interview guides were used in all rounds of data collection. These included questions on views about and involvements with alcohol, tobacco,

cannabis, and other illegal substances. The combined use of focus groups and individual interviews, allowed us to explore both collective opinions and beliefs about alcohol use, as well as the participants evolving experiences (Lambert & Loiselle, 2008). During the group discussions, we probed for stories about the social meanings related to alcohol use and collective interpretation of this phenomenon. However, as adolescents grew older, the individual interview settings allowed for an increased emphasis on their own alcohol experiences. The focus groups and interviews were conducted by the authors (JS, ORB, RT, KB), who are trained researchers with extensive interviewing experience. They took place at the schools during school hours or convenient places nearby when the adolescents grew older. Focus group discussions and interviews were audiotaped and transcribed verbatim. Pseudonyms were used and identifying factors were removed from the transcripts to preserve confidentiality. Active informed consent was obtained from parents when their children were under 16, and from the adolescents themselves when over 16. In the results section, quotes are marked with age and gender (M= male, F= female).

#### *Coding and analyses.*

Transcripts were systematically coded in the qualitative research software, HyperResearch. This process involved categorization of the content of the focus group discussions and interviews into several themes based on the interview guides, such as stated notions of alcohol and perceived reasons for drinking. We also integrated codes that emphasized the adolescents' expectancies of alcohol and their evolving alcohol experiences during the study period. To obtain unambiguous coding, one-third of the transcripts were coded by two researchers together, evaluated during the process and found to be satisfactorily congruent by both. All codes were organized chronologically to reflect each wave of data collection and to highlight the longitudinal aspect of the analysis. This approach enabled us to explore changes and continuities in the adolescents' representations of, attitudes concerning, and experiences with

alcohol during the studied time period (Saldana, 2003). In analyzing the data, we searched for patterns and interconnections of alcohol expectancies and linked them to contextual descriptions, for example, of peer relations and drinking experience. This sort of ‘theoretical’ thematic analysis (Braun & Clarke, 2006), focusing on the evolvement of adolescent alcohol expectancies, allowed for an added qualitative sensitivity to the statistical measures examined in the AOES (Leigh & Stacy, 1993).

### ***Mixed method analyses.***

The quantitative and qualitative data were collected during the same time period from the same schools, but on different student samples. The two study strands were analytically independent, and the results were mixed during the final interpretation (Creswell & Clark, 2017). The aim of the mixed method analysis was elaboration, enhancement, and illustration of the results from one methodological approach with the results from the other (Greene, et al., 1989, Creswell & Clark, 2017). In this analytical step, we took advantage of the conceptual and thematic overlap across the study strains and compared, contrasted, and synthesized T1-T4 findings from the quantitative and the qualitative data in the final analysis in the discussion (Creswell & Clark, 2017). We explored similarities and differences in the quantitative and qualitative results; described how they complement each other; and discussed how they contribute to an increased understanding of development of alcohol expectancies during adolescent years (Creswell & Clark, 2017).

### **Quantitative results**

Sociodemographic sample characteristics are presented in Table 1. Compared to the population of Norwegian adolescents, there was a small overrepresentation of girls, 8<sup>th</sup> graders and adolescents from the second most centrality category. Means for Social Facilitation Expectancies, Tension Reduction Expectancies and Negative Emotions Expectancies, as well as frequency of drinking alcohol are shown in Table 2. Means for the

first two were increasing over time, for each of the three age cohorts (Grades 8, 9 and 10 at t1). Also, at each time point, higher age (older cohort) was associated with higher means. The opposite was apparent for Negative Emotions Expectancies; means were decreasing with time and, and at each assessment, higher age was associated with lower means. Alcohol drinking frequency increased at with each assessment time point, and the drinking frequency was higher for adolescents in higher grade levels within each assessment.

The results from the linear mixed-effects models are presented in Table 3. The estimate for Social Facilitation Expectancies was 1.38 at age 13, which is low given that the scale ranges from 1 to 5. There was statistically significant increase with age; the estimated annual rate of change was 0.36 points per year. This estimate was virtually unchanged after including demographic variables in Model 2. However, the estimate was attenuated from  $b = 0.36$  (95% CI: 0.35, 0.38) to  $b = 0.23$  (95% CI: 0.21, 0.24) after including alcohol use in Model 3. Increase in alcohol use was associated with increase in Social Facilitation Expectancies.

The results for Tension Reduction Expectancies were similar to the results for Social Facilitation Expectancies. There was statistically significant increase with age  $b = 0.26$  (95% CI: 0.24, 0.28),  $p < 0.001$ . This estimate was virtually unchanged after including demographic variables in Model 2. However, the estimate was attenuated to  $b = 0.14$  (95% CI: 0.12, 0.16) after including alcohol use in Model 3. More alcohol use was associated with higher scores on Tension Reduction Expectancies,  $b = 0.29$  (95% CI: 0.27, 0.31),  $p < 0.001$ .

The results for Negative Emotions Expectancies differed from the two types of positive alcohol expectancies. In Model 1, there was statistically significant decrease with age  $b = -0.15$  (95% CI: -0.17, -0.13),  $p < 0.001$ . This estimate was almost identical in Model 2. However, the estimate was attenuated to  $b = -0.03$  (95% CI: -0.05, -0.01),  $p = 0.003$  after including alcohol use in Model 3. Although still statistically significant, the rate of change

indicates that the scale score at age 18 would only be 0.15 points lower than at age 13. More alcohol use was associated with lower scores on Negative Emotions Expectancies,  $b = -0.23$  (95% CI: -0.25, -0.21)  $p < 0.001$ .

As for the covariates, the gender differences were small ( $< 0.1$  scale points) for Social Facilitation Expectancies and Tension Reduction Expectancies, but girls had higher Negative Emotions Expectancies compare to boys. The differences between cohorts were small for Social Facilitation Expectancies and Tension Reduction Expectancies, but the older cohorts (9th and 10th grade at t1) had somewhat lower Negative Emotions Expectancies compared to the youngest cohort. There was a tendency that adolescents from the most central location (the Oslo area) had somewhat lower Social Facilitation Expectancies and Tension Reduction Expectancies compared to adolescents in less central locations, but no such difference was found for Negative Emotions Expectancies. For all three types of studied expectancies, there was notable residual within-person variance, and notable between-person variance in initial status and rate of change over time (see Table 3).

### **Qualitative results**

Analysis of the qualitative interview data also pointed to three main categories of expectancies associated with alcohol use. The first category was dominating at the beginning of the study and involved negative alcohol expectations of physical and social harms. The second focused upon the ways in which alcohol use could affect negative emotions, and the third, increasingly visible throughout the study period and most so at the end of it, involved social expectations of fun, enjoyment, and sociability. In the following, we present how these types of expectations were expressed over time, and how their prominence and manifestation developed from early to late adolescence.

***Alcohol use is harmful and dangerous.***

Expectancies of negative physical and social consequences of drinking were predominant in 8<sup>th</sup> grade. The adolescents talked about severe negative health consequences from drinking, violence and accidents. Bjarne explained: *'It's a lot of people who use alcohol, and they get really drunk, drive a car and die'* (Bjarne (M), 12/13). Frode followed the same line of reasoning and argued that alcohol *'burns your braincells'* (Frode (M), 12/13). At this early stage of adolescence, alcohol appeared distant. The adolescents' expectations were mostly expressed as abstract ideas, unrelated to own experiences, and the developmental change towards greater attention towards novel and intense experiences despite potential risks seemed not yet to have taken place. The following group discussion reflected young adolescents' ideas of the consequences stemming from alcohol use:

*Bjørn (M): You'll get drunk and fall to the ground.*

*Erlend (M): And vomit.*

*Frank (M): Get dizzy.*

*Bjørn (M): You start looking quite weird.*

*Frank(M): At least, that's what we believe. We haven't experienced it [being drunk], you know! (12/13)*

Within these stories, adolescents did not separate between drinking and intoxication, and they tended to emphasize acute negative consequences. Alcohol use was described as making people behave in uncontrolled, stupid, and dangerous ways, and the narratives often seemed to have an undertone of moralism:

*Ivar (M): I really don't understand why people drink.*

*Halvor (M): It's a lot of people who say it tastes like shit.*

*Nils (M): Well, most of those who drink, like those in ninth grade, they don't drink because of the taste, they only do it to get drunk.*

*Halvor(M): I don't intend to drink or anything.*

*Mats (M): No, me neither. I'm not going to smoke, not going to use snus (smokeless oral tobacco), and I'm not going to drink. (12/13)*

The above expectations, conveyed when the adolescents attended 8<sup>th</sup> grade, reflected a predominance of negative descriptions involving the harms and dangers from alcohol use.

They displayed low levels of ambiguity and few adolescents contradicted the dominant narrative of negative alcohol expectancies.

In 10<sup>th</sup> grade, adolescent expectations of alcohol use remained mostly negative and several participants anticipated severe consequences from drinking. Ida said: *'It involves a lot of vomiting and people do a lot of stupid things'* (Ida (F), 14/15). Stefan described such severe consequences in more detail: *'If you're drunk, you can throw up and drown in your own vomit. Or you can fall asleep in the ditch, and die from the cold'* (Stefan (M), 15/16).

However, at this age, adolescent expectations of harms and dangers became less one-sided and more complex and were increasingly mentioned alongside positive expectations: *'I believe that some people can get really aggressive, while others just get very happy or emotional.'* (Trude (F), 15/16). Trude's story illustrated how some of the adolescents began differentiating between various levels of drinking and forms of intoxication, such that some were positive and others negative. However, dramatic and negative alcohol expectations were still conveyed by most participants. Importantly, by the end of 10<sup>th</sup> grade, the majority (3/4) of the adolescents had not drunk, and non-drinking was frequently explained by expectations of acute negative consequences of harm and danger. Caroline described: *'Many people who drink too much get raped. So, I don't want to drink now.'* (Caroline (F), 15/16). While boys' and girls' expectations were overall very similar in early stages of adolescence, they differed more in later interviews in that fear of sexual assaults was highlighted by several girls. Additionally, several of the adolescents started to emphasize more long-term negative consequences as reasons for non-drinking: most importantly, they noted that drinking could affect their school- and sports achievements negatively or damage the trusting relationship they had with their parents.

### *Alcohol use affects emotions.*

In addition to expectations of harm and danger from drinking conveyed at ages 12/13, adolescents related alcohol use to emotions. The balance changed from mostly negative to more positive emotions as they grew older. These stories involved both the mental health harms caused by drinking, as well as the use of alcohol to cope with emotional distress. Mikael explained: '*Young people drink because they have problems at home, or to forget something bad.*' (Mikael (M), 12/13).

Expectations that drinking alcohol was related to negative emotions continued to be expressed in grade 10 as well: '*When people drink too much, they can get depressed and very upset.*' (Ranveig (F), 14/15). However, positive expectations that drinking could *relieve* tension were increasingly expressed at this age, and these opposing expectations were entangled. Egil expressed his ambiguous expectations towards alcohol use: '*I guess people drink to relax and let loose. And really, I would also love to do that, but I'm not going to, you know. It's not worth it. There's just too much stupid things that can happen.*' (Egil (M), 14/15). This quote illustrated the ambivalence towards alcohol present at this age - while Egil believed drinking could be a means to feel free and let go of tension, he was also concerned about the negative consequences from drinking, which led him to choose not to drink.

Overall, adolescents' alcohol expectancies seemed increasingly ambivalent. On the one side, alcohol could potentially relieve negative emotions and lead to feelings of freedom and relaxation. On the other side, alcohol was seen as the cause of various negative outcomes, such as accidents and severe mental health problems. Within these stories, positive claims were usually moderated and intertwined with negative expectations, both in adolescents' individual accounts, as well as in group discussions:

*Veronika (F): I think that ... young people who drink just want to unleash from everything, and especially at parties, I guess everything's a lot more fun [if you drink].*



*Ingrid (F): I think for those who drink, they don't dare to do these things when they're sober.*

*Elisabeth (F): And then ... you can get, like ... blackout, or whatever it's called.*  
(14/15)

In the above excerpt, Veronika talked about how drinking and letting go could make parties better, but instead of confirming her expectations, the other girls followed up with reservations: arguing that letting go through drinking alcohol was a kind of false expression of freedom, and that it would potentially end with a negative outcome.

At ages 16/17, more than half of the adolescents had tried alcohol, and they often emphasized expectations of letting go and feeling free as drivers for their initiation. Katrine had started to drink during the previous year and described: *'I love it when everyone gathers when we drink, you know, just unleash from it all, and dance, sing and all that'* (Katrine (F), 16/17). Egil had also recently started drinking and, in contrast to Katrine's positive story, he recounted that he had ended up very drunk doing *'a few stupid things'*, like vomiting and saying things he later regretted. Still, he enjoyed the sensation of being drunk: *I really liked it. Because I've always been the guy who thinks before he acts, you know. Like, should I do it or not? So, it was really liberating somehow, just being able to do it'* (Egil (M), 16/17). Both Egil and Frode had negative expectations towards alcohol use throughout lower secondary school. When first interviewed at the age of 12/13, Frode expressed concerns about the negative effects of alcohol on the brain. However, at 16/17, he had tried to drink alcohol a few times, and said he enjoyed the feeling. At the same time, he was afraid that drinking might have negative effects on his emotions and mental health, and said these concerns held him back from drinking frequently:

*I've been drinking, but I'm not a big fan. It's really nice when you feel those effects, but it's also the constant danger of vomiting, which I find very uncomfortable. And I guess drinking also has a lot of psychological side effects. Isn't it linked to depression and stuff?*  
(Frode (M), 16/17)

In the above quotes, Egil and Frode emphasized positive expectations of drinking, including feelings of relaxation and pleasure. At the same time, their previous negative expectations of alcohol as potentially contributing to stress, negative emotions, and trouble, seemed to linger on and contribute to an ambiguity towards drinking. Overall, adolescents' expectations that drinking would modify moods and emotions showed particular complexity throughout the years of study, illustrating how the pleasures and dangers of alcohol were complex and closely connected. As such, tension reduction features of alcohol use were both positively and negatively framed, and they were often intertwined.

***Drinking alcohol is fun and social.***

As described above, positive alcohol expectations were hardly present at ages 12/13, except to some extent for adult drinking: *'Adults can drink alcohol because they think it tastes nice, and they do it when they celebrate something. My dad, he loves wine, but he never gets drunk'* (Veronica (F), 12/13). These expectations were, however, often moderated, such as in Veronica's emphasis that her father never got drunk, even though he liked wine. In the beginning of 10<sup>th</sup> grade, positive expectations of drinking started to become more visible, although negative expectations still dominated. Few of the adolescents had tried alcohol, but those who had often emphasized social expectations of fun and sociability. Bjarte explained: *'I don't know how to explain it, it's not that it's about being tough [to drink], but it's about being involved, you know, at the parties'* (Bjarte (M), 14/15). Bjarte emphasized the link between drinking and taking part in social situations with peers but rejected that he did it to show off or to gain peer acceptance. Rasmus, who had been drunk a few times, talked about it with pride. For him, drinking alcohol seemed to be part of a rebellious identity – he liked hanging out late at nights and did not invest much in school. He described his drinking in a humorous way: *'The last time I drank was at a party. I started early and went home early [laughs]. But really, I'm not ashamed, I just wanted to have fun'* (Rasmus (M), 14/15). While

maintaining positive social expectancies of drinking alcohol, both Bjarte and Rasmus still seemed to relate their stories to restrictive alcohol norms. Bjarte argued that he did not drink to be ‘tough’ and thus pointed at negative expectations of alcohol use as something some people did for social status. His talk pointed to the increased importance of social status and peer acceptance during mid-adolescence, while his talk of how he himself would use alcohol for this reason indicated ambivalence. Similarly, Rasmus related his positive drinking story to issues of shame, thereby illustrating the duality and mix of both positive and negative expectations of alcohol use in adolescence.

By the end of 10<sup>th</sup> grade, it was evident that friends and social networks were important in the evolving positive expectations to alcohol use. Lea initially saw drinking as scary, but as more of her friends started drinking, her impressions changed:

*I used to think that alcohol was more scary than fun. But then, some of my friends started drinking and I joined them at a few parties, and I kind of got closer to alcohol. So, eventually I started to drink as well. (Lea (F), 15/16)*

While drinking was still uncommon at this time, alcohol was increasingly becoming a social reality for adolescents. Some non-drinkers highlighted that drinking could be seen as a form of social capital, giving them access to novel social arenas:

*I think there’s a lot of people who drink because it involves parties and something happening, and that they can be more social. And I get that, it’s been tempting for me as well. But still, I don’t think it’s worth it, because they do a lot of stupid things (Ida (F), 15/16)*

To some extent, Ida acknowledged the social value of drinking, but for her, the negative expectations still outweighed the positive. Unlike Ida, Gina had tried drinking a few times, but she still expressed ambivalence towards the social value of alcohol use:

*Well, it’s not cool to drink, but still it’s the cool people who drink, you know. They are the ones who use snus and attend parties every weekend to get drunk. I don’t know if that’s why they’re cool, but still, it’s those that are popular. (Gina (F), 15/16)*

Gina’s story illustrates the complex associations of alcohol and sociability during adolescence. While she linked drinking to popular peers and social status, her expectancies of

drunken behavior remained negative: *'Those who get drunk say a lot of stupid things and they're not thinking clearly'* (Gina (F), 15/16), thereby stressing her dual and ambivalent expectations.

By the time they started upper secondary school, around half of the adolescents had tried alcohol, and expectations of drinking as fun and sociable became increasingly noticeable in the interviews. Oskar had tried alcohol a few times and described parties as an important social arena for him and his peers: *'Everyone drinks on Saturdays. So, it feels kind of natural to meet up with them and drink. There's always a lot going on and it's way easier to meet new people.'* (Oskar (M), 16/17). Oskar perceived drinking as something 'everyone' did, or at least everyone he knew, and drinking was deemed an essential part of social life. Kassandra told a similar story about alcohol use at parties, although she had never tried it:

*The vibe just got a lot easier, you know, everyone talked to everyone. And it really affected me as well because I could do the same, even without drinking. So, I'll say it's something positive, as long as it's not too much [alcohol]* (Kassandra (F), 16/17).

Within the above stories, moderations were often included in the adolescent's positive expectations, and it was common to emphasize distinctions between acceptable and unacceptable ways of drinking. Julie explained: *'I don't think it's anything wrong with drinking, as long as people have control and take care of each other'* (Julie (F), 16/17). Egil also displayed levels of moderation and told that he planned to attend another party soon: *'I think I'll probably drink, but not so much this time. I don't want to start drinking just to drink, it's basically just to have a good time with my friends'* (Egil (M), 16/17). Within these accounts, the adolescent drinkers seemingly adopted a norm of moderation and differentiated between accepted levels of alcohol use.

Adolescents without any experience of alcohol use in upper secondary school still upheld similar reasons for their abstinence as earlier; they prioritized school and did not want to disappoint their parents. However, they also challenged the increasingly dominant narratives

of drinking as something fun. Marianne was critical of her classmates' stories about parties and drinking:

*Those at school always talk about parties and stuff. But I've seen how they behave, and I really can't understand why they want to be like that. My friend and I have just as much fun at parties, or perhaps even more, because we don't get sick afterwards and don't have to vomit and all that. (Marianne (F), 16/17)*

Similarly, Steinar did not drink and said that he and his friends had '*...other priorities than drinking and partying*' (Steinar (M), 16/17). Within these stories, non-drinkers often maintained how they could have similar, or even more fun without drinking. Even argued rhetorically: '*Attend a party where everyone is a fool? Then I would rather sit at home and watch a movie. My friends don't drink either*' (Even (M), 16/17). Similar to 8th grade narratives, non-drinkers sometimes described drinkers in derogative ways, naming them '*fools*' or describing them as '*... those who do worse at school*' (Steinar, 16/17). These descriptions may be seen as a response to the increasing alcohol use among their peers, in which abstinence became a label they had to defend. As such, those who refrained from drinking seemingly challenged the expectations of alcohol use as something fun and sociable. However, they were still aware of the important social arenas increasingly defined by parties and drinking situations. The non-drinkers' stories therefore illustrated the tensions and ambivalence in the adolescent's alcohol expectations, in which they struggled to maneuver their identities between confident choices not to drink, and the increasing stigma of not taking part in the important social arena of youth drinking.

## **Discussion**

Based on quantitative and qualitative longitudinal data, this study explored the development of alcohol expectancies among Norwegian adolescents from early to late adolescence. First of all, the three key expectancies examined using quantitative approaches – Social Facilitation, Tension Reduction, and Negative Emotions – were also reiterated in the adolescents' narratives and reproduced through qualitative analyses. Further, both of our analytical

approaches revealed complex shifts in these alcohol expectancies over the course of adolescence, and how these shifts related to individual alcohol use.

The results from quantitative analysis showed that positive expectancies of alcohol use related to social facilitation and tension reduction increased substantially during adolescence, while negative expectancies of emotional problems decreased only somewhat. This means that especially by late adolescence, many adolescents from our sample held both positive and negative expectations at the same time. These findings are in line with other studies showing that while positive expectancies rather consistently across studies tend to increase with age, negative expectancies either remain stable over time (Colder et al., 2014, Smit et al., 2018) or slightly diminish with age (Pinquart & Borgolte, 2022). Our results suggest that the change in alcohol expectancies during the course of adolescence could to a large extent be explained by increased drinking experience. This is in line with previous research showing that alcohol use strongly influences changes in alcohol expectancies (Smit et al., 2018). Still, we found changes in alcohol expectancies also after accounting for alcohol use. This suggest that change in expectancies has additional explanations, such as social learning.

The qualitative results indicated a similar course of development and provided insights into the complex and ambivalent nature both of adolescent drinking expectancies and of drinking itself. At the age of 12/13, the adolescents told vivid stories about how drinking and intoxication implied loss of control and led to dramatic and acute negative consequences. Over the 4-year study period, expectations that drinking could be fun, sociable, and a means of relaxation and liberation became more common. In line with the quantitative results, negative expectations were however, also still often expressed, and positive claims were often moderated, or followed up with examples of negative expectations. While expectations of danger and chaos seemed one-sided and uncomplicated at ages 12/13, such expectations were often mixed with positive and joyful expectations as the adolescents grew older. The lines

between positive and negative expectations thus became increasingly blurred and ambivalent over the course of development.

Breiner et al. (1999) theorized how ambivalence or conflict is a key element in alcohol expectancies and use. They posed how parallel, potentially independent influences of positive and negative expectancies create a dynamic competition between inclinations to approach and avoid drinking alcohol. Expectancies and motives to use alcohol can also be influenced by personality characteristics, social environment and personal experiences of drinking outcomes, and these are not necessarily internally consistent or static (Breiner et al., 1999:199). In the current study, the analysis of both questionnaire and qualitative data suggested that the adolescent's alcohol expectancies did not follow a simple transition from negative to positive beliefs. As the participants grew older, they increasingly held negative expectancies alongside positive expectancies; they were aware of both the attractive features and the harmful effects of drinking alcohol and such expectancies were related to individual drinking behavior. In the quantitative data, increased alcohol use was related to higher scores on positive expectations, while lower scores on negative. In the qualitative data, the adolescent's expectations came forward as a fusion of attractions and repulsions towards alcohol, situated in particular developmental and social circumstances (Breiner et al., 1999), that changed over time. One example was how boys' and girls' alcohol expectations, that were overall very similar in early adolescence, divided more as they grew older. Girls more often expressed negative expectations of being harmed or harassed in drinking situations, reflecting perhaps how the drunken youth party may represent a risky context for sexual exploitation and assault for girls in particular (Pape, 2014; Stefansen et al., 2019)

Interestingly, the development towards more complex alcohol expectancies was most visible from ages 14/15, while at the age of 12-13, adolescents' views on alcohol seemed to have more in common with children's notions of alcohol; they were one-sided, primarily

negative, and focused on physical and social harms (Sandberg & Skjælaaen, 2017, Smit et al., 2018, Jones & Gordon, 2017). Their expectations sounded like repetition of adult voices at this stage, while developmental changes towards greater peer orientation, sensation seeking and willingness to take risk (Cserwenka et al., 2013) accelerated from mid-adolescence. This supports the notion of an extended childhood (Twenge & Park, 2019), in which adolescents maintain alcohol expectations from early childhood and thus postpone their initiation of alcohol use. The marked skepticism towards alcohol among the younger adolescents could also reflect the Nordic drinking culture, where separate norms for adults' and youths' drinking, in which the latter is much less accepted, is a typical trait (Rolando et al., 2014, Bakken et al., 2017). Further, the high-risk drinking patterns in these countries may help sustain stories (Tutenges & Sandberg, 2013) that entail negative expectancies of alcohol as part of the drinking culture and may cause parents to encourage their children to postpone drinking as long as possible.

Both the quantitative and the qualitative findings indicated that participants with drinking experience had more positive expectancies of alcohol than those without such experience. At ages 15-16, when non-drinking was still most common, the adolescents typically emphasized negative effects of alcohol, parental expectations of non-drinking and perceptions of drinking as conflicting with sports- and school-oriented goals (Scheffels et al., 2021). In later adolescence, however, when drinking became more widespread, adolescents described increased acceptance, availability, social benefits, and peer-pressure as drivers for drinking initiation (Buvik et al., 2021).

At the same time, the results from this study underscored the ambivalence visible in both drinkers' and non-drinkers expectations of alcohol use. Those who refrained from drinking acknowledged the social status of drinking alcohol, while those who drank also acknowledged problems associated with alcohol use, and this ambivalence increased with age



and as alcohol gained more importance as part of their social lives. The analysis also demonstrated how positive and negative alcohol expectancies can be closely inter-related (Graham, 2003). Similar to how De Visser & Smith's (2006) study among young Dutch men demonstrated that motives for drinking were also sometimes motives for non-drinking, our study showed positive expectations about how alcohol could potentially relieve negative emotions and lead to feelings of freedom and relaxation present in adolescent's narratives alongside and intertwined with negative expectations of how it could possibly make them sad or cause mental health problems. As reflected in our qualitative data, adolescents seemed to become increasingly aware of this duality, in which alcohol intoxication can be seen as socially integrative as well as socially and personally destructive (Room, 1976).

At the age of 16/17, another dimension of ambivalence became apparent among the adolescents, in which drinking peers' claims of fun and sociability were challenged by those who did not drink. Both drinkers and non-drinkers appeared to relate more to socially shared positive attitudes towards drinking as they matured (Donovan et al., 2009). The abstainers seemed, however, to turn the alcohol expectancies of fun and sociability that was increasingly important among their peers and emphasize instead how they could have similar and competing fun with their non-drinking friends. This aligns with the strategies Pavlidis et al. (2019) found that young Finnish and Australian non-drinkers used to manage a soft stigma and negative labeling associated with non-drinking. Both in their study and ours, however, the abstaining adolescents also emphasized alternative fun and a community of other non-drinkers, in this offensively challenging the dominating drinking culture and contributing, perhaps, to consolidation of a new sober peer culture (Pavlidis et al., 2019). Similarly, Törrönen et al. (2021), studied longitudinally how young people aged 15 to 19 in Sweden negotiated their relation to alcohol in the context of declining youth drinking, and found that the adolescents' relation to drinking became more nuanced as they were approaching

adulthood. They noted also that ambivalence became more visible in the narratives of both drinkers and non-drinkers with age (Törrönen et al., 2021). Seen together, this demonstrates how alcohol expectancies are complex and must be viewed in line with age, gender and developmental changes, with adolescents' wider social contexts and with contemporary developments. Also, it indicates how the decline in youth drinking may affect what adolescents expect from alcohol over time. Adolescents' expectations of alcohol are likely to be affected by, as well as contribute to (Gordon et al., 2016), continuous developments in youth drinking culture.

### ***Implications for practice***

Our results point to how prevention strategies aimed at reducing underage alcohol use may benefit from a developmentally informed approach. Prevention strategies aiming to reduce underage alcohol use should integrate age-relevant educational messages de-emphasizing positive expectancies of alcohol. Targeting youth with elevated positive alcohol expectancies could also be considered. Further, prevention efforts could be informed by understanding the ambivalence towards alcohol that young people increasingly experience as they get older, by simultaneously considering the competing expectations that cue approach and avoidance of alcohol (Breiner et al., 1999). Increased awareness of how the pleasures and dangers of alcohol are closely connected and how alcohol's potential for transgression can also contribute to make drinking attractive may be useful in conversations with adolescents, as well as in alcohol prevention efforts.

### ***Limitations and future directions***

All quantitative variables were measured using self-reports, which is associated with socially desirable responding, and this may have affected the results. Also, as the qualitative data collection was carried out by adult researchers, some participants may have held back information of alcohol use. Moreover, as with most longitudinal studies, dropout may

introduce attrition bias, although longitudinal mixed models can address incomplete assessments of outcome under missing at random assumption (Singer & Willet, 2003). Another limitation is that the quantitative analyses only included three out of eight of the AOES sub scales, therefore we cannot generalize our findings to all types of positive and negative alcohol expectancies. Further, the results are not necessarily transferable to other study contexts or study populations. This points to a need for future research to explore in greater depth how alcohols' ambiguous position plays out in specific social groups of adolescents, i.e., according to gender and/or social status. The complexity of expectations showed in the qualitative results could inform quantitative research on alcohol expectations, e.g by defining tension reduction as a multifaceted instead of unidimensional positive expectancy.

### ***Conclusion***

The complementary findings from the quantitative and qualitative analyses demonstrated how ambiguity is a key marker of adolescent alcohol use and related expectations, be it positive or negative. The mixed method analysis offered insights into the co-occurrence of positive and negative expectancies, and into adolescents' struggle to negotiate these opposing expectations and ultimately, their relations with drinking. The entirety of our results thus demonstrated how a mixed method design can be fruitful when research questions call for a nuanced, contextual understanding of the real-life phenomena such as adolescent alcohol use and related expectations and how these develop during adolescence.

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Table 1. Sociodemographic sample characteristics ( $N = 3425$ ).

	%	$N$
<b>Gender</b>		
Boys	44.8%	1534
Girls	55.2%	1891
<b>Grade:</b>		
8th	37.1%	1271
9th	34.8%	1192
10th	28.1%	962
<b>Municipal centrality:</b>		
Most central	5.7%	193
Second most central	33.5%	1148
Above medium central	29.4%	1008
Medium central	15.4%	528
Second least central	13.1%	447
Least central	3.0%	101

Table 2. Alcohol expectancies and alcohol use at four annual assessments for three age cohorts.

Cohort	Time point	$N$	Age M (SD)	Social Facilitation	Tension Reducation	Negative Emotions	Alcohol drinking
				Expectanices M (SD) [% missing]	Expectanices M (SD) [% missing]	Expectanices M (SD) [% missing]	frequency M (SD) [% missing]
<b>Grade 8 at t1</b>							
	t1 (2017)	1141	13.37 (0.29)	1.55 (0.75) [6.1]	1.95 (1.04) [7.0]	3.08 (1.37) [7.3]	0.06 (0.35) [2.5]
	t2 (2018)	1106	14.38 (0.29)	1.91 (0.90) [2.9]	2.43 (1.16) [4.2]	3.12 (1.27) [4.9]	0.30 (0.81) [1.5]
	t3 (2019)	1069	15.36 (0.29)	2.27 (0.97) [1.6]	2.65 (1.19) [3.1]	2.76 (1.18) [3.2]	0.69 (1.07) [1.0]
	t4 (2020)	916	16.35 (0.29)	2.72 (1.03) [1.4]	2.96 (1.19) [1.9]	2.64 (1.16) [1.9]	1.14 (1.29) [1.0]
<b>Grade 9 at t1</b>							
	t1 (2017)	989	14.34 (0.29)	1.68 (0.82) [3.0]	2.14 (1.17) [4.3]	2.82 (1.36) [3.9]	0.16 (0.58) [1.5]
	t2 (2018)	1030	15.35 (0.30)	2.23 (0.98) [2.5]	2.57 (1.17) [3.5]	2.90 (1.22) [4.0]	0.56 (1.00) [1.9]
	t3 (2019)	908	16.33 (0.30)	2.62 (1.01) [1.2]	2.78 (1.18) [1.3]	2.58 (1.14) [1.2]	1.10 (1.26) [0.9]
	t4 (2020)	792	17.3 (0.30)	2.84 (1.02) [1.8]	2.96 (1.19) [1.9]	2.49 (1.07) [1.9]	1.52 (1.34) [1.5]
<b>Grade 10 at t1</b>							
	t1 (2017)	845	15.34 (0.31)	2.11 (0.99) [3.4]	2.43 (1.16) [4.6]	2.59 (1.25) [4.7]	0.41 (0.91) [1.7]
	t2 (2018)	721	16.39 (0.29)	2.75 (1.05) [1.1]	2.95 (1.21) [1.5]	2.58 (1.09) [1.8]	1.12 (1.29) [1.0]
	t3 (2019)	674	17.34 (0.29)	2.95 (0.99) [1.0]	3.03 (1.18) [1.2]	2.45 (1.05) [1.3]	1.64 (1.31) [1.0]
	t4 (2020)	620	18.33 (0.30)	3.04 (0.93) [1.1]	3.04 (1.18) [1.1]	2.31 (0.96) [1.3]	2.29 (1.25) [0.5]
<b>Total sample</b>							
	t1 (2017)	2975	14.25 (0.85)	1.75 (0.88) [4.3]	2.15 (1.14) [5.4]	2.85 (1.35) [5.4]	0.19 (0.64) [1.9]
	t2 (2018)	2857	15.24 (0.84)	2.24 (1.02) [2.3]	2.61 (1.19) [3.3]	2.90 (1.22) [3.8]	0.60 (1.07) [1.5]
	t3 (2019)	2651	16.19 (0.84)	2.56 (1.03) [1.1]	2.79 (1.19) [2.0]	2.62 (1.14) [2.0]	1.07 (1.26) [1.0]
	t4 (2020)	2328	17.20 (0.85)	2.85 (1.01) [1.5]	2.98 (1.19) [1.7]	2.50 (1.08) [1.7]	1.58 (1.37) [1.0]

Table 3. Alcohol expectancies from age 13 to 18 for Norwegian girls and boys.

	SOCIAL FACILITATION EXPECTANCIES			TENSION REDUCTION EXPECTANCIES			NEGATIVE EMOTIONS EXPECTANCIES		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
<b>Fixed effects</b>									
Rate or change with age	0.36***	0.36***	0.23***	0.26***	0.27***	0.14***	-0.15***	-0.14***	-0.03**
Alcohol drinking frequency			0.29***			0.29***			-0.23***
Gender (male)		-0.07*	-0.06*		-0.10***	-0.07**		-0.24***	-0.25***
Cohort:									
Grade 8 at t1		Reference	Reference		Reference	Reference		Reference	Reference
Grade 9 at t1		-0.13***	-0.07*		-0.13***	-0.08*		-0.05	-0.08*
Grade 10 at t1		-0.09*	-0.03		-0.13**	-0.09*		-0.13**	-0.15***
Centrality:									
Most central		Reference	Reference		Reference	Reference		Reference	Reference
Second most central		0.23***	0.21***		0.19*	0.15*		0.07	0.12
Above medium central		0.18**	0.17**		0.12	0.11		0.08	0.11
Medium central		0.23***	0.23***		0.20*	0.19*		0.10	0.12
Second least central		0.46***	0.35***		0.29***	0.17*		-0.12	-0.01
Least central		0.34***	0.29***		0.31*	0.24*		-0.19	-0.11
Intercept (age 13)	1.38***	1.22***	1.33***	1.93***	1.85***	1.97***	3.10***	3.19***	3.08***
<b>Variance components (SD)</b>									
Level 1 (Within person)	0.73	0.73	0.71	0.93	0.93	0.91	0.96	0.96	0.95
Level 2 (Between person):									
Initial status	0.42	0.41	0.41	0.70	0.70	0.70	1.04	1.03	1.02
Rate of change	0.12	0.12	0.13	0.17	0.17	0.19	0.21	0.21	0.21
Correlation (initial status, rate of change)	0.37	0.32	-0.11	-0.36	-0.38	-0.55	-0.81	-0.81	-0.87
<b>Information criteria</b>									
Akaike's	27315	27236	26072	31825	31792	31024	32362	32282	31722
Bayesian	27358	27337	26181	31868	31894	31132	32405	32383	31831

Note: \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Supplementary table 1. Participation at t1 to t4 of the MyLife study.

Participation patterns				Frequency	%
t1	t2	t3	t4		
✓	✓	✓	✓	1638	48
✓	✓	✓		471	14
	✓	✓	✓	191	6
✓	✓		✓	174	5
✓		✓	✓	140	4
✓	✓			231	7
✓			✓	73	2
✓		✓		67	2
	✓	✓		64	2
		✓	✓	58	2
	✓		✓	27	1
✓				181	5
	✓			61	2
			✓	27	1
		✓		22	1
Total				3425	100