Temporal trends and socioeconomic differences in alcohol use and drunkenness among Swedish adolescents

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Abstract

This study examined temporal trends and socioeconomic differences in alcohol use and drunkenness among Swedish 15-year-old students between 2001/02 and 2017/18. Data were obtained from the Health Behaviour in School-aged Children (HBSC) study conducted in 2001/02, 2005/06, 2009/10, 2013/14 and 2017/18 (n ≈ 1500/year). Socioeconomic status (SES) was measured using two alternative indicators: educational aspirations and family affluence. Logistic regression models were used to investigate the relationships between drinking measures and SES indicators. The results showed a significant decline in alcohol use and drunkenness among Swedish 15-year-old students from 2001/02 to 2017/18. Educational aspirations almost consistently statistically negatively predicted regular alcohol use and drunkenness. Family affluence only had a weak effect on adolescent drinking behavior with a tendency for less affluent students reporting less alcohol use and drunkenness. Trend analyzes within the subgroups indicated that the downward trend was mirrored in all SES groups, but it was not equally steep in all groups. The decrease was generally weaker among students with lower educational aspirations but stronger among students from less affluent families. This study suggests that different aspects of SES may influence adolescent drinking in opposing directions. In future efforts aimed at reducing alcohol use and drunkenness among adolescents, students with lower educational aspirations should be the target population.

Keywords

Adolescence, alcohol use, drunkenness, socioeconomic status, trends, HBSC, Sweden.
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1 Introduction

Alcohol use and drunkenness among Swedish adolescents has been declining to the lowest levels in recent decades. The prevalence rates of adolescent alcohol use were at its highest level in the 1970s, when around 90% of Sweden’s 15-year-old students reported alcohol use. Between the 1980s and 1990s, the prevalence rates were relatively stable, but have dropped significantly since the turn of the millennium. Currently, the proportion of Swedish ninth graders reporting alcohol use is at historically low levels since the measuring of youth drinking started in the 1970s. Only about 40% of Swedish teenagers report they have consumed alcohol in ninth grade, and those who drink are starting to do so at a later age and are drinking less often and in smaller quantitative than previous generations (Guttormsson, 2019; Kraus et al., 2019). A noteworthy observation in this context is that adult and youth drinking in Sweden were synchronized closely in the 1980s and 1990s, but youth drinking developed an independent trajectory at the turn of the millennium. This clearly indicates that something has changed in the drinking culture of young Swedes (Norström and Raninen, 2015; Törrönen et al., 2019).

The decline in youth drinking is far from a Swedish phenomenon. Similar trends have been observed internationally, including North America, Australasia and in most high-income European countries (Carlson, 2018; Vashishtha et al., 2019). A recent literature review concluded that the prevalence rates of youth drinking have decreased fairly simultaneously in numerous of Western countries since the beginning of the 2000s. In addition, a decline in youth drinking has also been identified in some Asian countries and in Brazil, suggesting what appears to be a global trend (Pape, Rossow and Brunborg, 2018; Raninen et al., 2018). How this trend should be understood is still under investigation (Carlsson, 2018). Some hypotheses on why youth drinking is falling have however been put forward, including changes in parenting style, increased use of social media, changes in gender identities, as well as trends in health, fitness, wellbeing and lifestyle behavior (Kraus et al., 2019; Pape, Rossow and Brunborg, 2018; Raninen et al., 2018; Törrönen et al., 2019). Recent research has also suggested that there may have been a change in the social status of alcohol so that drinking has lost its symbolic power as a cool activity signaling entry to adulthood, which may also have contributed to the decrease in youth drinking (Kraus et al., 2019; Törrönen et al., 2019; Vashishtha et al., 2019).
Previous studies have found these declines to be collective across consumption groups (Pape, Rossow and Brunborg, 2018). These findings lend support to Skog’s (1985) collectivity theory which posits that any changes in per capita consumption will result in similar changes in all drinking groups, due to the social interaction or mutual influence between drinkers. Although some studies have indicated the presence of collectivity in the observed decline in youth drinking, it cannot be precluded that certain subgroups have deviated from the overall trend – in terms of both rate and direction (Norström and Raninen, 2017). Social and cultural boundaries, for example, between different socioeconomic groups, might well impede social exchange processes, potentially resulting in unequal changes in these subgroups (Norström and Raninen, 2017; Skog, 2001; Zeebari et al., 2017). Nevertheless, relatively little research has examined whether the observed downward trend in adolescent alcohol use varies by socioeconomic status (SES), and there are no such studies known to the author available in Sweden. Moreover, existing research into the relationship between SES and adolescent alcohol use has been surprisingly inconclusive, with studies indicating positive, negative and null relationships (Hanson and Chen, 2007; Kendler et al., 2014).

Socioeconomic disadvantage is one of the strongest predictors of morbidity and premature mortality worldwide (Stringhini et al., 2017). One of the major factors contributing to these health inequities are socioeconomic status differences in health-compromising behaviors such as substance use (smoking, alcohol and drugs) poor diet and insufficient physical activity (Mackenbach et al., 2015; Richter et al., 2013; Stringhini et al., 2017). Many of these behaviors are usually initiated during adolescence and persist throughout life, making adolescence a critical period for tackling health inequalities later in life (Mutumba and Schulenberg, 2019). In light of this, it is important to analyze trends in youth drinking across groups that differ with respect to SES. This does not only deepen our understanding of socioeconomic disparities in adolescent alcohol use, but also provides valuable information to policy makers and practitioners about specific target populations when planning interventions aimed at reducing youth drinking (Liu et al., 2016).

The present study serves as a first step to exploring temporal trends in socioeconomic differences in adolescent alcohol use and drunkenness in Sweden. Specifically, the aims are: (i) to analyze trends in adolescent alcohol use and drunkenness between 2001/02 and 2017/18, (ii) to investigate whether alcohol drinking behavior vary by SES, and (iii) to examine whether these relationships have changed over the years.
2 Background

2.1 Social and cultural contexts of alcohol use

How young people make decisions around the when, where, with whom and (more importantly) how much and how often they consume alcohol is strongly influenced by social and cultural norms (Kraus et al., 2019; Roumeliotis, 2012: 51; Seaman and Ikegwuonu, 2010). The formation of these norms in terms of attitudes largely takes place in the context of family, school, neighborhood and through peer influence (Kraus et al., 2019). They are unwritten rules or expectations of behavior within a specific social group or culture that offer social standards for acceptable and unacceptable social behavior, such as appropriate ages for trying alcohol or getting drunk for the first time (Kraus et al., 2019; Paglia and Room, 1998). These timing norms are internalized and constitute a ‘social clock’ or temporal script that dictates when certain life events should occur, and either you are ‘on time’ or ‘off-time’ (Paglia and Room, 1998).

Drinking to intoxication has traditionally been seen as something teenagers are expected to do as part of growing up, and even considered as a rite of passage signaling entry to adulthood (Pennay, Lubman, MacLean, 2011; Sande, 2002; Törrönen et al., 2019). Alcohol is used by young people for many of the same reasons that it is used by adults – for example, to enhance sociability, to escape problems, for enjoyment. But for young people drinking is also about experimentation with altered states of consciousness, various aspects of adult lifestyle and identity exploration (Pennay, Lubman, MacLean, 2011; Seaman and Ikegwuonu, 2010). From this perspective, adolescent drinking may be viewed as a normal (perhaps even healthy) curiosity about transitioning to adult life, making the usage of alcohol an important symbolic marker for young people wishing to position themselves within a social system (de Looze et al., 2016; Roumeliotis, 2012: 55–56).

As adolescent drinking has decreased since the beginning of the 2000s, researchers have started to suggest that the social status of alcohol may have lost its symbolic power as a rite of passage signaling entry to adulthood, thus also its function as a normative ‘social clock’ that might pressure adolescents to start drinking ‘on time’ (Paglia and Room, 2002; Törrönen et al., 2019). In other words, the social and cultural norms underlying alcohol use may have changed among today’s adolescents, so that drinking alcohol plays a less important role, or no role, in their life.
(Kraus et al., 2019; Obstbaum, 2019). Instead, young people today seem to be more willing to engage in competing activities to drinking such as social media and playing computer games, course work, doing sports and fitness activities, going to movies or talking about books – simply put, activities that are often related to a lifestyle of non-drinking (Törrönen et al., 2019). This devaluation of alcohol and the use of it may have contributed to the observed downward trend in youth drinking (Kraus et al., 2019).

2.2 Consequences of alcohol use

Despite these declines, alcohol use and especially misuse among adolescents remains a major public health concern (Kendler et al., 2014). The weight of evidence shows that risky drinking such as frequent drinking and drunkenness is associated with adverse psychological, social and physical health consequences, including violence, accidents, injuries, unwanted sexual intercourse, academic failure and use of other substances (Hart, 2015; Vieno et al., 2018; Marshall, 2014; Mason et al., 2010; Svensson and Landberg, 2013; Swahn et al., 2010; Thor, Karlsson and Landberg, 2019). It has also been suggested that drinking alcohol during adolescence may negatively affect brain development and functioning, resulting in memory impairment, problems with concentration and information retrieval processes (Clark, Thatcher and Tapert, 2008; Vieno et al., 2018; Spijkerman, van der Eijnden and Huiberts, 2008; Welch, Carson and Lawrie, 2013). In addition, early age of alcohol initiation has been linked to greater risk of developing excessive alcohol consumption or alcohol dependence at an advanced age (Hingston, Heeren and Winter, 2006).

2.3 Socioeconomic differences in alcohol use

Many studies have documented the relationship between adolescent drinking and SES, but findings have been mixed (Vieno et al., 2018). A meta-analysis of SES and health behaviors in adolescence found no clear pattern of associations between SES and alcohol consumption; most included studies found a null relationship, while positive and negative relationships were approximately equally prevalent (Hanson and Chen, 2007). Another meta-analysis of SES and adolescent alcohol use showed that most included studies found that youth drinking prevalence was higher the lower an individual’s SES was, but results were inconclusive when only regarding European studies (Lemstra et al., 2007; Gomes de Matos et al., 2017). Similarly, a recent cross-national study comparing socioeconomic inequalities in adolescent heavy episodic
drinking across 24 European countries found that lower SES was associated with a significant increase in the odds of heavy episodic drinking in 10 countries, and a significant decrease in the odds in one country (Shackleton, Milne and Jerrim, 2019). Swedish research on this issue has also yielded mixed findings. While some reported higher prevalence of youth drinking in low than in high SES groups (Carlsson and Almquist, 2016; Thor, Karlsson and Landberg, 2019), others reported lower prevalence of youth drinking in lower SES groups (Carlsson, 2018; Olsson and Fritzell, 2015).

There are several possible explanations for this discrepancy among findings. For example, socioeconomic disparities in adolescent alcohol use might vary between countries according to country-level factors such as national income and income inequality (Gomes de Matos et al., 2017). While it is possible that cross-country differences may partly explain the heterogeneity of results, it also possible that differences in methods and measurements have contributed (Huckle, You and Casswell, 2010; Torsheim et al., 2004). In their review of the literature, Hanson and Chen (2007) reported that most studies relied upon one single measure, typically parenteral occupation or education. However, prior studies have suggested that adolescent self-reports on parental occupation and education may be inaccurate due to high levels of missing data common in the collection of parental occupation and educational status of parents. Hence, inconsistency among findings may reflect a low reliability and validity of conventional SES indicators (Torsheim et al., 2004). Results may also differ between studies depending upon measures used. Some studies have suggested that different measures of SES may not relate to adolescent drinking in the same way in terms of both strength and direction. It is yet unclear whether certain components of SES differ systematically in this regard (Kendler et al., 2014; Pape, Norström and Rossow, 2016).

3 Theoretical framework

A framework based on Skog’s work with the collectivity theory and Rogers’ diffusion of innovation model has been used to make sense of the temporal trends and socioeconomic differences in adolescent alcohol use. The spread of new drinking patterns could be usefully explained in terms of the collectivity theory. This theory posits that any changes in per capita
consumption will result in similar changes across the population due to the social interaction or mutual influence between individuals. To extend the collectivity theory and account for SES specific trends, the diffusion of innovation model could be incorporated in this work. This theory suggests that behavioral changes are often last adopted by lower socioeconomic groups.

3.1 The theory of collectivity of drinking cultures

Skog’s (1985) theory of the collectivity of drinking cultures has been very influential in alcohol epidemiology, since it offers a social explanation for collective changes in population drinking (Nordström and Svensson, 2014; Raninen, Leifman and Ramstedt, 2013). The theory starts out from the idea that drinking is essentially a social phenomenon and that the social interaction or mutual influence between drinkers contributes to collective changes in alcohol consumption across the whole population (Raninen, Leifman and Ramstedt, 2013; Skog, 1985).

The theory states that an individual’s drinking behavior is strongly affected by the drinking habits of her peers, or more generally by the drinking behavior in her personal network – both directly in face-to-face interactions and more indirectly through informal social control. Skog (1985) argues that an individual’s possibilities for changing his or her drinking habits are very limited if the drinking habits in her social network are fairly stable. Similarly, the possibility of not changing her drinking habits by resisting the impact of changes in her network’s drinking habits is also limited. Consequently, individual changes in alcohol consumption are expected to be synchronized across the whole social network.

According to Skog (1985), society can be conceived as an enormous social network. This is because each individual is influenced by a fairly small number of peers, family members, and the like, but is also indirectly tied to a great number of others individuals by common friends, by common friends of common friends, and so on. In other words, each individual is considered to be influenced, either directly or indirectly, by practically every other member of the network. Hence, the theory predicts that, as a consequence of social diffusion processes, all groups of drinkers – from the lightest to the heaviest drinking groups – change the intake of alcohol in the same direction when the total consumption increases or decreases in the population. Put differently, the whole population is expected to move as one up or down the consumption scale (Pape, Rossow and Brunborg, 2018; Raninen, Livingston and Leifman, 2014; Skog, 1985).
Five recent studies – one from Norway (Brunborg, Bye and Rossow, 2014), and four from Sweden (Carlsson, 2019; Norström and Svensson, 2014; Norström and Raninen, 2018; Raninen, Livingston and Leifman, 2014) – provided support to the collectivity of drinking hypothesis, implying that the general decline in adolescent drinking since the beginning of the 2000s was reflected at all levels of consumption. However, some notable exceptions to Skog’s predicting drinking trend have also been reported in the literature. For example, Zeebari et al. (2017) showed a clear divergence in the rate of drinking among Stockholm youth between 2000 and 2014, with most adolescent quantiles reducing consumption, while heavy consumption remained stable. The researchers concluded that the results were indicative of a polarization rather than a parallel displacement of the whole distribution. Whether these contradictory results can be explained by differences between Stockholm youths and youths in Sweden in general, or by the different statistical methods used, is less clear (Carlsson, 2019).

It is known that social and cultural boundaries might impede the social interaction or mutual influence between demographic subgroups (e.g. sexes, socioeconomic strata, and the like) and thereby the collective displacements of consumption, potentially resulting in unequal changes in alcohol use in these subgroups when a general change in per capita alcohol consumption occurs (Norström and Raninen, 2018; Skog, 2001; Zeebari et al., 2017). Furthermore, the normativity of drinking and informal social control may well differ between such groups, potentially providing further barriers to collective changes (Jackson et al., 2017; Raninen, Livingston and Leifman, 2014).

Whether the reduction in adolescent drinking varies by socioeconomic strata has been examined in Finland (Liu et al., 2016; Torikka et al., 2017), Germany (Richter et al., 2013), the UK (Bhattacharya, 2016), the USA (Jang et al., 2017) and Australasia (Jackson et al., 2017; Livingston, 2014). These studies have consistently demonstrated that the prevalence has dropped across social strata, but not to same extent. For example, the US study found that the reduction in regular drunkenness was smaller in low than in high SES groups (Jang et al., 2017), while the decline in frequent binge drinking in Finland was weaker among girls of lower SES than among other girls (Liu et al., 2016). Moreover, another Finnish study showed that depressed teenagers in socioeconomically deprived groups even had increased their alcohol consumption since the turn of the millennium (Torikka et al., 2017). In Germany, the overall trend in alcohol use was quite similar in all SES groups measured in terms of educational track
3.2 Diffusion of innovation theory

Roger’s work with the diffusion of innovation theory is one of the most widely used theories for studying adoption of new ideas, practices or technologies, and understanding how these are spread within and between population groups. A variety of studies over the years have employed the diffusion model to examine substance-related behavior, including the use of alcohol, tobacco and illicit drugs. The model has proven to be particularly valuable for studying patterns of onset and cessation of substance use among populations subgroups (Ferrence, 2001).

Rogers (2003) defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. As expressed in this definition, the four key components of the diffusion model are: innovation, communication channels, time and the social system. According to this theory, an innovation is an idea, process, or a technology that is perceived as new by the members of a social system. It matters little whether the innovation is truly novel – as long as it is perceived as new by the individual it is an innovation. Innovations can be characterized by their relative advantage over alternative products or behaviors, their compatibility with existing values or needs, their complexity, trialability (risk involved in experimental use) and their observability (Rogers, 2003: 12–15; Ferrence, 2001). Additional attributes may include impact on social relations, modifiability and commitment required to adopt the innovation (Ferrence, 2001). Given the increase in young people who choose not to drink alcohol, or who choose to drink less, shunning alcohol may be viewed as an innovation among the young people of today.

Communication is a key mechanism for how new ideas and behaviors are diffused among groups of people, involving mass media or interpersonal communication. These channels serve as the link between those who have the know-how of an innovation and those who have not yet adopted it (Sharma and Kanekar, 2008). Mass media channels are usually the most rapid and efficient means of informing people about the existence of new ideas, while interpersonal channels are more efficient in persuading people adopting new ideas (Rogers, 2003: 18). However, a fundamental principle of human communication is that the exchange of ideas usually takes place between individuals who are alike in certain attributes such as sex, social
background, and the like (McPherson, Smith-Lovin and Cook, 2001). Homophily may therefore act as an invisible barrier that slows down the rate of diffusion across sociodemographic strata, as homophilous diffusion patterns cause new ideas and behaviors to spread horizontally rather than vertically (Rogers, 2003: 305–307).

According to Rogers (2003), members of a social system can be classified as innovators, early adopters, early or late majority and laggards based upon the relative time at which an innovation is adopted. Diffusion research has shown that those who adopt new ideas early in the diffusion process tend to have, for example, higher social status, higher aspirations for formal education, a more favorable attitude toward change, greater exposure to mass media channels and greater exposure to interpersonal communication, and engage in more active information seeking. In other words, these characteristics of adopter categories suggest that earlier adopters have generally higher SES than do later adopters (Rogers, 2003: 298). As a consequence, the individuals in a system who most need the benefits of a new idea (the less educated, the less wealthy, and the like) are generally the last to adopt an innovation, which tends to widen socioeconomic gaps between the higher- and lower SES individuals (Rogers, 2003: 295).

A number of studies have employed the diffusion model to examine substance-related behavior, including the use of alcohol, tobacco and illicit drugs. Ferrence (2001) reviewed this literature and concluded that most studies examined support the application of the diffusion model in the study of substance use. In recent years, the diffusion model has proven to be particularly useful for studying changes in tobacco use. For example, Pampel et al. (2015) used the diffusion model to make sense of cross-national and temporal variation in the relationship between education and tobacco use. Overall, their results coincide well with the predictions of the diffusion model; smoking uptake begins with higher educational groups but is followed by diffusion of smoking to lower educational and rejection of the habit by higher educational groups. Divergences from the general decline in adolescent alcohol use have also been interpreted in the context of the diffusion model (Jackson et al., 2017; Liu et al., 2013; Pape, Rossow and Brunborg, 2018). However, these studies have interpreted their findings in terms of the diffusion model, rather than hypothesizing these relationships up front. They nonetheless are in high agreement with the characteristics of adopters found in the diffusion model.
3.3 Empirical expectations

What might be expected in terms of empirical patterns? Considering that several studies have documented the presence of collectivity in youth drinking, with a synchronized decrease across drinking groups (Brunborg, Bye and Rossow, 2014; Carlsson, 2019; Norström and Svensson, 2014; Raninen et al., 2014), at-risk groups¹ (Norström and Raninen, 2017) and sociodemographic subgroups (Jackson et al., 2017; Liu et al., 2016; Richter et al., 2013), there are strong reasons to expect that the decades-long decline of adolescent alcohol use in Sweden should be reflected in all SES groups. Although the decline in alcohol use has occurred across social strata, it has not been equally steep in all groups. Prior studies have reported both smaller and slower declines seen among lower SES groups compared with higher SES groups (Liu et al., 2016; Jackson et al., 2017; Jang et al., 2017). Therefore, a second expectation is that the observed decline should be smaller in low than in high SES groups. However, it should be noted that this expectation rests on rather weak foundations, as there are no such studies known to the author available in Sweden, and studies elsewhere have produced mixed results. On the other hand, if alcohol has lost its status as a cool and compulsory ritual in the transition to adulthood (Kraus et al., 2019; Törrönen et al., 2019), it is reasonable to expect differential trends in youth drinking since those who first adopt new behaviors are usually individuals of higher SES.

4 Data and methods

4.1 Participants and procedure

The present study is based on data from the Health Behavior in School-aged Children (HBSC) study, a World Health Organization (WHO) collaborative cross-national survey. Since the beginning of the 1980s, the HBSC study has collected data every four years on 11-, 13-, and 15-year-old boys’ and girls’ health and well-being, social environments and health behaviors. Most recently, the HBSC study was carried out in 49 countries and regions across Europe and North America (Inchley et al., 2016). The purpose of the HBSC study is to gain new insights

¹ Risk factors were measured by asking whether the respondent has used narcotics, wants to try narcotics, smoke tobacco, dislikes school and skips school.
into, and increase understanding of health behaviors, health, well-being, lifestyles and social contexts of young people in different countries, thereby allowing for cross-temporal and cross-national comparisons in the said areas of research.

The data included for this study consists of five consecutive HBSC surveys conducted in Sweden in 2001/02, 2005/06, 2009/10, 2013/14 and 2017/18 by the Public Health Agency of Sweden (Folkhälsomyndigheten). In each of the five waves, the sampling method was carried out in a two-step cluster design. First, a national representative cluster of schools was randomly selected. Second, a selection of schools or classes in each grade was included in the study, with at least 1,500 pupils in each grade. All students within selected classes were included in the sample (Carleby et al., 2011). The response rate on school level varied across survey years between 47 % and 88 % (\(\bar{r} = 75.8\%\)), while the response rate on the individual level (students who were present and chose to participate) varied between 85 % and 90 % (\(\bar{r} = 87.8\%\)). As regular alcohol consumption is still rather rare among 11- and 13-year-old students, these age groups were excluded from the analyzes (Richter et al., 2013). For all analyzes, cases with missing values on alcohol use, drunkenness, family affluence, educational aspiration as well as gender and immigrant background were excluded (\(n = 1,345: 14\%\)). The analytical sample comprised 8,051 15-year-old students of whom 49 % were boys and 51 % were girls.

4.1.1 Ethical considerations

Research involving human subjects must be conducted in an ethical manner that respect the rights, safety and integrity of research participants and that recognizes the responsibility of researchers. This is especially important when research participants are children (Currie et al., 2010). The HBSC study follows these key ethical issues at each stage of the survey process. All countries are required to provide documentation that informs participants in the study and their schools, parents/guardians of the ways in which confidentiality and anonymity are assured, give details of who has access to the data and how it is stored and used. Confidentiality and anonymity, in particular, is explained in a way that also children can understand. Instructions for those administering the survey highlight the importance of ensuring that children are aware that they can choose whether or not to participate (Currie et al., 2010; Public Health Agency of Sweden).
It is also worth noting that this study was based on already collected data and any ethical problems related to data collection were not aggravated by the use of the data. Permission to use the data has been approved by the Public Health Agency of Sweden.

4.2 Measures of drinking behavior

Previous research has shown opposite, or very dissimilar, social gradients for different measures of adolescent drinking behavior (Huckle, You and Casswell, 2010; Järvinen, Ellergaard and Larsen, 2014; Pape, Norström, Rossow 2016). For example, some studies have demonstrated that drinking frequency increases with income and educational level, whereas drinking to excess is more common in lower SES groups (Huckle, You and Casswell, 2010; Järvinen, Ellergaard and Larsen, 2014). This highlights the importance of including more than one drinking measure (Pape, Norström, Rossow 2016). For this reason, the present study used two different measures of adolescent drinking behavior: i) alcohol use, and ii) drunkenness.

4.2.1 Alcohol use

Alcohol use was measured by asking the students: ‘At present, how often do you drink anything alcoholic, such as beer, wine or strong liquor (including small amounts)?’ For each alcoholic beverage (beer, wine, strong liquor, cider, and alcopop), the possible answers were ‘daily’, ‘at least once a week’, ‘at least once a month’, ‘rarely’ and never’. Students who responded ‘daily’ on each alcoholic beverage were considered unreliable and were therefore excluded from further analyzes ($n = 68$). Responses indicating alcohol consumption of any alcoholic beverage at least once a month were coded as 1 (regular alcohol use), while those responses indicating less than monthly alcohol use were coded as 0 following prior research and HBSC reports (Liu et al., 2013; Liu et al., 2016; Public Health Agency of Sweden, 2018).

4.2.2 Drunkenness

Drunkenness was assessed by asking the students whether they had ever had so much alcohol that they were ‘really drunk’. The response alternatives were: ‘yes, more than 10 times’, ‘yes, 4-10 times’, ‘yes, 2-3 times’, ‘yes, once’, and ‘no, never’. Responses indicating having been drunk on two or more occasions were defined as ‘frequent drunkenness’ (coded as 1, and 0 otherwise). Considering the included age groups, this is the cut-off point most frequently reported in the relevant scientific literature (Schmid and Nic Gabhainn, 2004).
4.3 Measures of socioeconomic status

While most previous studies have relied upon one single SES measure – typically parental occupation or education (Hanson and Chen, 2007; Kendler et al., 2014; Pape, Norström and Rossow, 2016) – the present study assessed the role of two alternative indicators of SES: i) family affluence, and ii) educational aspirations. Each of the above measures may be viewed as overlapping but distinct dimensions of social class and thus provide different pieces in the puzzle of understanding how SES is tied to adolescent alcohol use (Fismen, Samdal and Torsheim, 2012; Lien, Friestad and Klepp, 2001; Thor, Karlsson and Landberg, 2019).

4.3.1 Family affluence

Family affluence was measured using the Family Affluence Scale (FAS). This scale is a measure of material family wealth developed as an indicator of young people’s absolute socioeconomic status (Currie et al., 2008a; Hartley, Levin and Currie, 2016; Torsheim et al., 2018). FAS has been used to examine and explain socioeconomic inequalities in a wide range of health outcomes in the HBSC study for more than 20 years (Currie et al., 2008a). A valuable property of this type of indicator is that it is less vulnerable to inaccurate reporting and missing data than conventional protocols for adolescent reporting of parental occupation, education or income (Currie et al., 2008a; Hartley, Levin and Currie, 2016; Torsheim et al., 2004).

The scale comprises four items that assesses car ownership (‘Does your family own a car, van or truck?’), response categories: 0 = ‘no’, 1 = ‘yes, one’, 2 = ‘yes, two or more’), own bedroom (‘Do you have your own bedroom for yourself?’), response categories: 0 = ‘no’, 1 = ‘yes’), family holidays (‘During the past 12 months, how many times did you travel away on holiday with your family?’), response categories: 0 = ‘not at all’, 1 = ‘once’, 2 = ‘twice’, 3 = ‘more than twice’) and family computers (‘How many computers does your family own?’), response categories: (0 = ‘none’, 1 = ‘one’, 2 = ‘two’, 3 = ‘more than two’). A composite score was calculated for each student based on his or her response on these four items. For the creation of the composite score, the two last categories of family holidays and family computers were combined, which resulted in a total range of 0–7. The composite scores were subsequently recoded into a three-point ordinal scale, where ‘low’ (score 0 to 3) indicates low family

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3 Previous studies have reported non-response on parental occupational or educational status varying from 20% to 45%. In contrast, the proportion of missing data on FAS items has varied between 2% and 3% (Currie et al., 2008a). In the present study, the non-response on the full composite scale was 6%.
affluence, ‘middle’ (score 4 and 5) indicates middle family affluence, and ‘high’ (score 6 and 7) indicates high family affluence (Currie et al., 2008b; Liu et al., 2013).

### 4.3.2 Educational aspirations

Educational aspirations were included in the analysis as a proxy for student’s future social position. Previous research has suggested that adolescents own socioeconomic position may become increasingly relevant as they grow older. Since most young people have not yet achieved their own socioeconomic position it is logical to focus on their educational aspirations (Hagquist, 2007; Hanson and Chen, 2007). The logic here is that educational intentions today forecasts differences in socioeconomic attainment tomorrow (Friestad, Lien and Klepp, 2001; Hällsten and Thaning, 2018). Importantly, it also reflects the socio-cultural resources and the culture at home. The fact that adolescent’s choice of educational route is heavily affected by family background is soundly documented in the scientific literature (Friestad, Lien and Klepp, 2001; Hällsten and Thaning, 2018; Koivusilta et al., 2001). There are several possible mechanisms that may influence the pathway from social background to children’s educational aspirations. For example, education is presumably more highly valued in better educated families, and parents with higher level of education will on average be better able to provide their children the cultural capital needed to succeed in the existing educational system (Erikson, 2016; Koivusilta et al., 2001).

Educational aspirations were measured by asking the students to which secondary school programme he or she intended to apply after completing compulsory basic education. The alternatives were ‘will enter higher education preparatory programme’, ‘will enter vocational programme, “will not enter upper secondary programme’, and ‘do not know’

Responses were dichotomized into two categories defined as ‘higher education preparatory’ and ‘lower educational aspirations’. Students aiming for higher education preparatory programmes were coded as 1, while those students with lower educational aspirations were coded as 0.

---

4 The question and response alternatives differed slightly across survey years. In the first three waves students were asked: ‘What do you think you will do after completing compulsory basic education?’ The alternatives were ‘will enter higher education preparatory programme’, ‘will enter vocational programme’, try to get an apprenticeship’, try to get a job’, ‘be unemployed’, and ‘do not know’. In the last two waves, however, students were asked which secondary school programme he or she intended to apply for, which means that response alternatives regarding apprenticeship, work and unemployment were not present in these waves. While not ideal, these items were considered to be comparable across the years of investigation as they consistently intend to measure students’ educational aspirations.
4.4 Covariates

Prior research has shown that immigrant students tend to drink less or less often than native-born students due to, for example, cultural or religious norms (Amundsen, Rossow and Skurtveit, 2005), and that poverty rates are higher among immigrant children than among native-born children (Gustafsson and Österberg, 2018). Therefore, all analyses are adjusted for immigrant background, a potential confounder for the association between SES and adolescent drinking. Immigrant background was measured using information on student’s and parent’s country of birth. Responses were recoded into a three level categorical variable, where ‘first-generation immigrants’ (coded as 2) indicates students born abroad, ‘second-generation immigrants’ (coded as 1) indicates students born in Sweden with one or both of their parents being born abroad, and ‘Swedish’ (coded as 0) indicates students born in Sweden of Swedish-born parents (Carleby et al., 2011; Hällsten and Thaning, 2018).

4.5 Data analysis

The overall trends in regular alcohol use and frequent drunkenness were explored through descriptive statistics. As previous studies have indicated clear differences in adolescent alcohol use between boys and girls (Jackson et al., 2017; Liu et al., 2016; Pape, Rossow and Brunborg, 2018; Richter et al., 2013), the prevalence rates of the two drinking behaviors in the five survey years were presented separately for boys and girls. Changes in prevalence rates across the years of investigation were graphically displayed using a bar chart.

The relationships between alcohol use, drunkenness and indicators of SES were examined by means of logistic regression models. This estimation procedure is feasible when studying outcomes that are represented by binary variables (Mood, 2010). In essence, the logistic model predicts the logit of $Y$ from $X$, where the logit is the natural logarithm ($\ln$) of odds of $Y$, and odds are ratios of the probabilities ($P$) of $Y$ happening (reporting regular alcohol use or frequent drunkenness) to probabilities ($1-P$) of $Y$ not happening (not reporting regular alcohol use or frequent drunkenness) (Peng, Lee and Ingersoll, 2002). Unfortunately, logistic regression coefficients do not have the same straightforward interpretations than that of linear regression coefficients. In fact, interpreting log-odds ratios or odds ratios over and above the direction of the relationship is not directly feasible (Best and Wolf, 2013; Karlsson, Holm and Breen, 2010, Mood 2010). This problem stems from the fact that logit coefficients are confounded with
residual variation (unobserved heterogeneity). Differences in the extent of unobserved heterogeneity across groups, samples, or time points may produce apparent difference in coefficients that are not indications of actual differences in effect size (Allison, 1999).

As a part of the research interest revolves around comparing estimates across SES groups at different time points, the effects of the independent variables were reported as average marginal effects (AME). In this way, the problem of comparing log-odds ratios or odds ratios across groups, samples, or time points was circumvented. In addition to being relatively robust against biased comparisons of coefficients, AMEs have the advantage of allowing an easy and intuitive interpretation: they express the average change in probability (in percentage points) associated with a one-unit difference in one of the independent variables keeping the others constant (Best and Wolf, 2013; Mood, 2010). Differences in regular alcohol use and frequent drunkenness according to educational aspirations and family affluence were estimated separately for boys and girls for each wave and for all waves pooled. In each model, the highest group of educational aspiration and family affluence (i.e. students aiming for higher education preparatory programmes and high family affluence) served as reference category with AMEs being computed for the other groups in comparisons. All model specifications included a control for immigrant background.

Trends in regular alcohol use and frequent drunkenness across each of the SES indicators were examined using predicted probabilities calculated from the corresponding model estimations. Predicted probabilities of reporting regular alcohol use and frequent drunkenness were calculated across each of the SES indicators by setting all other independent variables to their observed values in the sample with the estimations from the logit models. Trends in socioeconomic differences in the drinking measures were examined by analyzing the difference in predicted probabilities across the years of investigation. Widening differences in probabilities were taken as an indication of widening socioeconomic differences in adolescent drinking, and vice versa. Trend analyzes within the subgroups were performed by calculating the relative change in predicted values separately for each category of educational aspiration and family affluence between the first and the last measuring point. Graphical displays of the predicted probabilities were used to visually describe trends in adolescent drinking in the different SES groups. To take into account the possible effect of cluster sampling, standard errors were clustered at the school level (Norström and Svensson, 2014; Richter et al., 2013). All statistical analyzes were conducted using the statistical software package Stata 16.
5 Results

5.1 Descriptive statistics

Characteristics of the sample and prevalence rates of alcohol use and drunkenness are presented in Table 1. The ratio of boys to girls was relatively equal across survey years, although there were slightly more girls than boys. Students aiming for higher education preparatory programmes increased during the study period for both sexes. In 2001/02, 54.8 % of the boys and 59.1 % of the girls reported higher educational aspirations, while the corresponding figures were 59 % for boys and 69.4 % for girls in 2017/18. Table 1 also indicate a general increase in family affluence over time. In 2001/02, 44.8 % of the girls and 51.3 % of the boys reported high family affluence, while the corresponding figures were 56.9 % for boys and 59.4 % for girls in 2017/18. Students with immigrant background also increased during the years of investigation. Among all students, regardless of sex, first-generation students increased by 34.2 %, while second-generation students increased by 46.1 %.

5.2 Overall trends in alcohol use and drunkenness

Trends in regular alcohol use and frequent drunkenness between 2001/02 and 2017/18 within the sample are shown in Figure 1. As this shows, the prevalence rates of regular alcohol use dropped considerably during the study period for both sexes. In 2001/02, roughly half of the boys (51.4 %) and half of the girls (50.7 %) reported regular alcohol use, while the corresponding figures in 2017/18 were 13 % for boys and 16.2 % for girls. This implies that the relative decrease in regular alcohol use was somewhat more evident among boys (74.7 %) than that of girls (68.1 %). The result suggests that the decreasing trend in regular alcohol use has slowed down, and there is even some indication that the prevalence increased somewhat between 2013/14 and 2017/18 among boys.

A similar pattern emerged with drunkenness. The proportion of boys in the sample reporting frequent drunkenness decreased from 40.3 % in 2001/02 to 9.1 % in 2017/18, while the corresponding figures among girls dropped from 37.7 % in 2001/02 to 11.8 % in 2017/18. The relative decrease in frequent drunkenness was again somewhat greater for boys (77.4 %) than for girls (68.7 %).
Table 1: Descriptive characteristics of the sample and prevalence rates of alcohol use and drunkenness by survey year and sex.

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<td>277</td>
<td>49.3</td>
<td>441</td>
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<td>285</td>
<td>50.7</td>
<td>231</td>
<td>34.4</td>
<td>250</td>
<td>36.1</td>
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<td>230</td>
<td>40.9</td>
<td>339</td>
<td>50.5</td>
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<tr>
<td>Low</td>
<td>42</td>
<td>7.7</td>
<td>50</td>
<td>8.9</td>
<td>36</td>
<td>5.3</td>
<td>54</td>
<td>7.8</td>
<td>44</td>
<td>5.1</td>
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<td>262</td>
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<td>39</td>
<td>7.1</td>
<td>48</td>
<td>8.5</td>
<td>40</td>
<td>6.0</td>
<td>36</td>
<td>5.12</td>
<td>65</td>
<td>7.6</td>
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<td>2nd generation</td>
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<td>62</td>
<td>11.0</td>
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<td>106</td>
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<td>452</td>
<td>80.5</td>
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<td>551</td>
<td>79.5</td>
<td>639</td>
<td>74.2</td>
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<td>47.0</td>
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<td>48.9</td>
<td>900</td>
<td>51.1</td>
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<td>Family affluence</td>
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<td>Immigrant background</td>
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</table>
Figure 1: Prevalence rates of regular alcohol use and frequent drunkenness by sex and survey year among 15-year-old Swedish students, 2001/02–2017/18 (%).

5.3 Socioeconomic differences in alcohol use and drunkenness

In the following, socioeconomic differences in regular alcohol use and frequent drunkenness are examined using logistic regression models. Models were conducted separately for boys and girls for each wave and for all waves pooled. The effects of the independent variables are reported as average marginal effects. The analyzes with regular alcohol use as outcome are shown in Table 2. For the pooled sample, students with lower educational aspirations were statistically more likely than students aiming for higher education preparatory programmes to report regular alcohol use, all else being equal. This was true for both sexes, although the effect of educational aspirations was somewhat stronger for girls (0.12) than for boys (0.07). Within the five waves, significant differences between the subgroups were found in most waves for both sexes, showing that students with lower educational aspirations were more likely than students aiming for higher education preparatory programmes to report regular alcohol use, all else being equal.

As concerns differences in alcohol use between students with differing levels of family affluence, the results were somewhat inconclusive. For the pooled sample, family affluence was
significantly positively associated with regular alcohol use for boys but not for girls, showing that boys from less affluent families were statistically less likely than their more affluent peers to report regular alcohol use, all else being equal. In the different waves, when taken separately, family affluence only had a small effect on regular alcohol use among boys, whereas largely no significant effects were found among girls. However, in almost all waves there was a tendency for students from less affluent families to report lower rates of regular alcohol use compared with their more affluent peers. Both first- and second-generation students were less likely than native-born of native-born parents to report regular alcohol use for the pooled sample, whereas largely no significant effects were found within the five waves, all else being equal.

**Table 2:** Logistic regression models of regular alcohol use on educational aspirations, family affluence, and immigrant background among 15-year-old Swedish students, 2001/02–2017/18 (average marginal effects in percentages points).

<table>
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<tr>
<th></th>
<th>All years</th>
<th>2001/02</th>
<th>2005/06</th>
<th>2009/10</th>
<th>2013/14</th>
<th>2017/18</th>
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<td>Educational aspirations</td>
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<tr>
<td>Lower . . . . . . .</td>
<td>0.07 ***</td>
<td>0.10 *</td>
<td>0.07</td>
<td>0.15</td>
<td>0.05 *</td>
<td>0.07 *</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Family affluence</td>
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<tr>
<td>Low . . . . . . . .</td>
<td>−0.08 **</td>
<td>−0.10 *</td>
<td>−0.05</td>
<td>−0.18</td>
<td>−0.12 ***</td>
<td>−0.10</td>
</tr>
<tr>
<td>Middle . . . . . .</td>
<td>−0.05 **</td>
<td>−0.16 **</td>
<td>−0.02</td>
<td>−0.00</td>
<td>−0.07 **</td>
<td>0.20</td>
</tr>
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<tr>
<td>1st generation . . .</td>
<td>−0.08 **</td>
<td>−0.06</td>
<td>−0.16 *</td>
<td>0.01</td>
<td>−0.00</td>
<td>−0.10 *</td>
</tr>
<tr>
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<td>−0.00</td>
<td>−0.07</td>
<td>0.02</td>
<td>0.01</td>
<td>0.06 *</td>
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<tr>
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<td>Educational aspirations</td>
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<tr>
<td>Lower . . . . . . .</td>
<td>0.12 ***</td>
<td>0.03</td>
<td>0.14 ***</td>
<td>0.16 ***</td>
<td>0.06 *</td>
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<td>−0.14</td>
<td>−0.04</td>
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<td>−0.03</td>
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</tr>
<tr>
<td>1st generation . .</td>
<td>−0.06 *</td>
<td>−0.03</td>
<td>−0.06</td>
<td>−0.04</td>
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<tr>
<td>2nd generation . .</td>
<td>−0.06 **</td>
<td>0.11 *</td>
<td>−0.08</td>
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Note: Models were conducted separately for boys and girls for each wave and for all waves pooled.

*P<0.05; **P<0.01; ***P<0.001.
A similar pattern emerged with drunkenness (Table 3). For the pooled sample, students with lower educational aspirations were statistically more likely than those students aiming for higher education preparatory programmes to report frequent drunkenness, all else being equal. This was true for both sexes, though in the case of girls, the effect of educational aspirations was again somewhat stronger than for boys (0.14 vs. 0.08). With the exceptions of boys in 2009/10 and girls in 2001/02, this association was consistent across the survey years, showing a higher probability of frequent drunkenness with lower educational aspirations, all else being equal.

**Table 3:** Logistic regression models of frequent drunkenness on educational aspirations, family affluence, and immigrant background among 15-year-old Swedish students, 2001/02–2017/18 (average marginal effects in percentages points).

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<th>2005/06</th>
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<td>0.08 ***</td>
<td>0.16 *</td>
<td>0.09 **</td>
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<td>0.05 *</td>
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<td>−0.07</td>
<td>−0.11 *</td>
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<tr>
<td>1st generation . .</td>
<td>−0.06 **</td>
<td>−0.07</td>
<td>−0.02</td>
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<tr>
<td>2nd generation . .</td>
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**Note:** Models were estimated separately for boys and girls for each wave and for all waves pooled. *P<0.05; **P<0.01; ***P<0.001. N/E, not estimable.

Regarding family affluence, the results did not indicate any clear differences in frequent drunkenness between students with differing levels of family affluence. The differences were
rather small, and in most cases did not reach the conventional level of statistical significance. The exception was boys from lower- and middle-class families for whom a statistically significant negative effect on frequent drunkenness was found in 2001/02, 2009/10 and for the pooled sample, showing a lower probability of frequent drunkenness with lower family affluence, all else being equal. Again, students with immigrant background were less likely to report frequent drunkenness for the pooled sample, whereas largely no significant differences in frequent drunkenness between students with different immigrant status were found within the five waves, all else being equal.

5.4 SES-specific trends in alcohol use and drunkenness

SES-specific trends in regular alcohol use and frequent drunkenness are analyzed below. Trends in the two drinking behaviors are displayed as predicted probabilities based on the logistic models estimations from previous section. Drinking trends among students with different educational aspirations are shown in Figure 2. The prevalence of regular alcohol use and frequent drunkenness decreased in both educational aspiration groups during the study period, consistent with the first empirical expectation (that the downward trend in youth drinking should be reflected in all SES groups). However, the level of decrease was somewhat smaller for students with lower educational aspirations than for students aiming for higher education preparatory programmes. Among students with lower educational aspirations, the relative decrease in regular alcohol use was 70 % for boys and 64 % for girls, while the corresponding figures among students aiming for higher education preparatory programmes was 79 % for boys and 70 % for girls (Figure 2a).

A similar pattern emerged with drunkenness, but these differences were quite modest among boys (79 % vs. 76 %), while they were somewhat larger for girls (74 % vs. 55 %) (Figure 2b). Hence, the second empirical expectation receive some support in that the reduction was smaller among students with lower educational aspirations than among students aiming for higher education preparatory programmes. It is also interesting to note that the downward drinking trend among girls with lower educational aspirations did not start until 2009/10, implying that the decrease in drinking behaviors among girls with lower educational aspirations has been slower than among girls aiming for higher education preparatory programmes.
Figure 2: Predicted probabilities of (a) regular alcohol use and (b) frequent drunkenness by educational aspirations, sex and survey year. Data points that are filled indicate statistically significant estimates, while hollow data points indicate insignificant estimates.
Figure 3: Predicted probabilities of (a) regular alcohol use and (b) frequent drunkenness by family affluence, sex and survey year. Data points that are filled indicate statistically significant estimates, while hollow data points indicate insignificant estimates.
Looking at the difference in predicted values between the two educational aspiration groups, there were no clear indications of widening socioeconomic differences in students’ drinking behaviors during the study period. The results rather indicated that the relationship between frequent drunkenness and educational aspirations weakened somewhat for boys.

Drinking trends among students with differing levels of family affluence are displayed in Figure 3. The prevalence of regular alcohol use and frequent drunkenness has also dropped in all FAS groups during the study period, indicating support for the first empirical expectation. Again, the level of change was not consistent in the three FAS groups. But in contrast to the differing trends observed for the two educational aspiration groups, the relative decrease was generally greater among students from less affluent families compared with their more affluent peers, especially in terms of regular alcohol use. When comparing the level of change in regular alcohol use among students of low and high FAS groups, there was a differential of 16 percentage points for boys (92 % vs. 76 %) and 24 percentage points for girls (93 % vs. 69 %) (Figure 3a).

For girls, a similar pattern emerged with drunkenness, while the reverse pattern was true for boys (Figure 3b). For boys, the relative decrease was 73 % among student with low FAS, while the corresponding figures for student with high FAS was 82 %. Overall, these results deviate somewhat from the second empirical expectation in that the decrease was generally greater in low than in high FAS groups. Again, there were no signs of growing discrepancy by SES in adolescent drinking. The results rather indicated that the relationship between frequent drunkenness and family affluence weakened somewhat for boys. However, the results presented in Figure 3 should be interpreted with some caution since the point estimates did not reach the conventional level of statistical significance in all five waves of data collection.

6 Discussion

A great deal of research has shown that adolescent alcohol use has decreased dramatically in most European and North American countries and regions since the beginning of the 2000s. A number of studies have shown that teenagers across social strata drink less, though the reported
decrease has not been equally steep in all groups, and some subgroups have not followed the downward trend (Pape, Rossow and Brunborg, 2018). These differences in trends partially support the diffusion model, which suggest that behavioral changes are often last adopted by disadvantaged groups (Jackson et al., 2017). Whether the decrease in adolescent alcohol use varies by SES has not been studied extensively in Sweden. Therefore, the present study was carried through in order to examine the relationship between adolescent drinking and SES among Swedish 15-year-old students over time.

### 6.1 Main findings

Consistent with prior research, the results of the present study suggested a drastic decline in adolescent drinking, implying more than 50% decrease in the proportion reporting regular alcohol use and frequent drunkenness during the study period. This was true for both sexes, although the reduction was notably smaller for girls than for boys. This finding is consistent with growing evidence of greater declines seen among boys than among girls (Pape, Rossow and Brunborg, 2018). Some research has hypothesized that changes in sex roles – allowing girls greater autonomy and a wider range of social options – and a shift in the targeting of alcohol marketing to young females may have contributed to this variability in trends between sexes, but more research is needed (Bratberg et al., 2016; Jang et al., 2017; Simons-Morton et al., 2009).

The results showed that educational aspirations was negatively associated with both drinking measures for the total sample, and in most waves throughout. This was true for both sexes, though in the case of girls, the effect of educational aspiration was somewhat greater than for boys. The results on variables concerning family affluence were somewhat inconclusive. For the total sample, there was evidence that family affluence was positively associated with regular alcohol use for boys but not for girls. However, in the different waves, when taken separately, family affluence only had a small impact on regular alcohol use for boys, whereas largely no significant effects were found for girls. Moreover, the results did not indicate any clear differences in frequent drunkenness by family affluence. Overall, these findings are in accordance with previous studies wherein family affluence or alternative indicators of families’ socioeconomic circumstances only had a weak effect on adolescent drinking with a tendency for more affluent students to report more frequent alcohol use, while the observed relationship with educational aspiration rather has been negative (Liu et al., 2016; Richter et al., 2013).
The analyzes provided support for Skog’s (1985) theory of collectivity of drinking behavior in that the reduction in adolescent drinking was mirrored in all SES groups. This result also ties well with the first empirical expectation, i.e. that the observed downward trend in adolescent alcohol use should be reflected in all SES groups. This expectation was based on the fact that several studies have found these declines to be collective across consumption categories and sociodemographic groups (Brunborg, Bye and Rossow, 2014; Jackson et al., 2017; Liu et al., 2016; Norström and Raninen, 2017; Norström and Svensson, 2014; Richter et al., 2013). However, the reduction was not equally steep in all SES groups. The relative decrease was generally weaker among students with lower educational aspirations but stronger among students from less affluent families. Taken together, these results provide mixed support for the second empirical expectation, i.e. that the reduction should be smaller in low than in high SES groups. However, this expectation rested on rather weak foundations, as there are no such studies known to the author available in Sweden, and studies elsewhere have produced mixed results (Jackson et al., 2017; Jang et al., 2017; Liu et al., 2016; Richter et al., 2013; Torikka et al., 2016).

The variability in trends partially supports the diffusion model, which suggests that lifestyle behaviors may change at different rates (and sometimes even in different directions) in different social strata, with earlier adopters having generally higher SES than do later adopters (Rogers, 2003; 298; Skog, 2001). This tendency was particularly evident among girls with lower educational aspirations, for whom the downward drinking trend emerged somewhat later than for students aiming for higher educational preparatory programmes. However, the variation in changes among students with different educational aspirations was relatively small, with the exception of the smaller decline in frequent drunkenness seen among girls with lower educational aspirations compared with girls aiming for higher education preparatory programmes. Furthermore, considering that the decrease was generally larger for students from less affluent families than for their more affluent peers, the results do not point unequivocally to the conclusion that low SES presented barriers to mutual influence for changes in adolescent drinking in Sweden. One potential explanation is that the internet and social media has transformed the very nature of diffusion by decreasing the importance of physical distance between people, thereby potentially reducing socioeconomic barriers of crucial social exchange processes (Rogers, 2003; 215–216). Also, shunning alcohol has relatively high trialability and low need for resources. Hence, the special characteristics of shunning alcohol may help speed
the adoption of such innovative health-promoting behaviors by all SES groups, including those with few resources.

Moreover, there were no clear indications of growing discrepancy by SES in adolescent drinking during the study period. The results rather indicated that the relationship between frequent drunkenness and SES weakened somewhat over time for boys, though this result should be interpreted with some caution since the point estimates did not reach the conventional level of statistical significance in all five waves of data collection. Nevertheless, it has to be stressed that socioeconomic differences in adolescent drinking between the two educational aspiration groups were found in almost all years of investigation. This implies that those students, especially girls, with lower educational aspirations should be the target population for future interventions aiming to reduce regular alcohol use and frequent drunkenness among adolescents.

Similar to other studies (Hanson and Chen, 2007; Kendler et al., 2014; Melotti et al., 2011; Richter et al., 2013), the current study indicated that different aspects of SES may influence adolescent drinking in opposite directions. Although the present study indicated only a few significant differences in adolescent drinking among the three FAS groups, the observed associations with family affluence were positive, while adolescent drinking were negatively associated with educational aspirations. One potential explanation for these diverse findings is the variable mechanisms whereby SES can affect adolescent drinking (Kendler et al., 2014). For example, higher family wealth may be associated positively with alcohol consumption among parents, with alcohol access at home, and with alcohol-related norms in the parental home (Pape, Norström and Rossow, 2016; Pedersen, Bakken and von Soest, 2015), whereas educational aspirations may relate to the ability and proneness of a person to adopt more healthy behaviors, including reduced alcohol use (Koivusilta, Rimpelä and Rimpelä, 1998). Taken together, these findings underscores that SES is a multidimensional phenomenon that cannot be reduced to one single dimension (Doku et al., 2010; Hällsten and Thaning, 2018).

6.1.1 Limitations

A number of limitations associated with the approach employed in the present study should be noted. Firstly, the analyzes presented here are restricted to the variables available across all five waves of data collection, which consequently limits the scope of the present study. It also implies that there may be omitted variables operating in parallel to those reported in this study.
For example, considering that the family’s influence on the behaviors and attitudes generally weakens as that of other arenas increases during adolescence (Kim, Evans and Hagquist, 2019; Olsson and Fritzell, 2015), other contextual variables, such as attitudes and drinking among peers, time spent with peers, school ethos, might have an effect adolescent alcohol use both directly and interactively with socioeconomic background. Furthermore, geographic location could also moderate the relationship between adolescent drinking and SES, as both the availability of alcohol and norms of acceptable drinking behaviors may vary with respect to geographic area. In addition, the density of acquaintance (the extent to which people in a community know one another) is probably higher in smaller communities than that of larger cities, implying that students’ adoption rate may vary depending on geographic area. Unfortunately, non-availability of time-series data for these variables did not allow to include them in the present investigation, which has the potential to bias the relationship between adolescent drinking behaviors and SES.

Secondly, as data on students’ drinking behaviors were self-reported, the reported prevalence may be biased due to over- or underreporting according to what students believe is more socially desirable or acceptable (Carlsson, 2018; Liu et al., 2013; Richter et al., 2013). There is, however, ample evidence that self-reported data on adolescent drinking is reliable (Lintonen et al., 2004; Norström and Svensson, 2014; Thor, Karlsson and Landberg, 2019). Also, students whose responses were considered exaggerated were omitted from the analyzes. Moreover, while the dichotomous classifications of alcohol use and drunkenness might be considered somewhat crude and may cause some loss of information, such classifications are probably less sensitive to reporting errors (Liu et al., 2013; Richter et al., 2013). However, a potential threat to this study is that socially desirable responding may differ systematically by SES, which has the potential to bias the results in unpredictable ways (Richter et al., 2013; Shackleton, Milne and Jerrim, 2019).

Thirdly, despite the widespread use of FAS, it should be noted that certain biases may apply to the items selected for this scale (Boyce et al., 2006; Currie et al., 2008a). For example, car ownership may vary according to availability of public transport and urban, suburban, or rural area of residence, and having a room of one’s own may be related to family size or age and sex of other children, implying that the instrument may not be fully consistent with the available resource of the family (Boyce et al., 2006; Carleby et al., 2011; Currie et al., 2008a; Liu et al., 2013; Torsheim et al., 2004). This could potentially lead to an underestimation of the FAS effect.
in the present investigation. On the other hand, the value of existing items in the FAS may also have changed over time due to economic and technological developments. For example, increased access to computers and more affordable air travel over the years could have had a direct impact on the individual items, although these general societal trends are not directly related to family affluence (Makransky et al., 2014; Torsheim et al., 2016). In other words, certain items selected for this scale may not be invariant across survey years. Taken together, other measures, such as parental reports of occupation, education, or income, should therefore be used whenever possible.

### 6.1.2 Future research

This study has provided further insights into temporal trends in socioeconomic differences in alcohol use and drunkenness among Swedish adolescents, but more research is warranted. Future research should continue to elaborate on this subject by investigating the impact of more fine-grained measures at different stages of adolescence along with a broad range of alcohol-related outcomes using more refined regression models and methods for time trends, preferably in a longitudinal setting. Future research would also benefit from including additional covariates that might be related to SES and that are also likely to impact upon adolescent drinking to thereby gain insights into the potential mechanisms through which SES influence alcohol-related outcomes in adolescence. Those could include attitudes and drinking among peers, leisure time activities, school performance, permissive parenting and availability of alcohol. Other topics for future research may include investigating spatial variation in adolescent drinking over time, and exploring possible mechanisms for the changed drinking behavior of adolescents.

### 6.2 Concluding remarks

The results of this study revealed a dramatic decrease in regular alcohol use and frequent drunkenness among Swedish 15-year-old students between 2001/02 and 2017/18. The prevalence of the two drinking behaviors has decreased in all socioeconomic groups, but not to the same extent. The reduction was generally weaker among students with lower educational aspirations but stronger among students from less affluent families. Educational aspirations almost consistently statistically negatively predicted regular alcohol use and frequent drunkenness, whereas family affluence only had a weak effect on drinking behavior, with a tendency for less affluent students reporting less regular alcohol use and frequent drunkenness.
The study suggests that the steepness and the shape of the social gradient in adolescent alcohol use might vary according to different aspects of SES. In future efforts aimed at reducing alcohol use and drunkenness among adolescents, students with lower educational aspirations should be the target population.
References


