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Social Mobility as a predictor of Alcohol and Tobacco use among Dutch Adolescents

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Abstract

This longitudinal study evaluates if alcohol and tobacco use of the adolescent are predicted by social mobility, and if effortful control influences this relationship. Social mobility refers to acquisition of adolescents' own socioeconomic status based on education level and in relation to the socioeconomic status level of their parents. Six groups, representing upward, downward and equal social mobility, were identified. The TRacking Adolescents Individual Lives Survey (TRAILS) dataset, which is a nationally representative longitudinal sample of 2.230 adolescents from The Netherlands was used. The predictive effect of social mobility on smoking and drinking was evaluated by separate hierarchic linear regression analyses. The main finding was that social mobility predicts tobacco, but not alcohol use. This finding might be interesting for future research and policies because alcohol and smoking are mostly seen as similar risk behaviours. However, the impact of socioeconomic status on these behaviours might be differently.

Keywords: socioeconomic status, social mobility, alcohol, smoking, adolescents

Abstract

Deze longitudinale studie onderzoekt of het alcohol- en tabaksgebruik bij adolescenten wordt voorspelt door hun sociale mobiliteit en of effortful control invloed heeft op deze relatie. Sociale mobiliteit is de acquisitie van de adolescent zijn/haar eigen sociaaleconomische status, gebaseerd op educatieniveau en in relatie tot de sociaaleconomische status van de ouders. Zes groepen, welke upward, downward en equal sociale mobiliteit representeren zijn vergeleken. Deze studie maakt gebruik van de TRacking Adolescents Individual Lives Survey (TRAILS) dataset, welke een nationaal representatief sample van 2.230 Nederlandse adolescenten omvat. Het voorspellende effect van social mobility voor roken en drinken werd apart geanalyseerd door middel van hierarchische lineare regressie analyses. Sociale mobiliteit bleek een voorspeller te zijn voor roken, maar niet voor alcohol. Deze bevinding zou interessant kunnen zijn voor toekomstig onderzoek en beleid omdat alcohol en roken vaak gezien worden als gelijke risicogedragingen. Echter, de impact van sociaaleconomische status op deze gedragingen zou anders kunnen zijn.

Trefwoorden: sociaaleconomische status, social mobility, alcohol, roken, adolescenten

Introduction

Among 15-year-old Dutch adolescents 25% smoked at least once in their lives and 26% consumes alcohol monthly (e.g. Trimbos Instituut, 2016; WHO, 2016). Health risk behaviours such as drinking alcohol and using tobacco onset during adolescence and might be influenced by parental socioeconomic status (SES), but also by adolescents' own acquired SES (i.e. educational level). Social mobility refers to the possible change from parental SES to own acquired SES, and can express itself in upward, stable or downward social mobility (Motta, Lima, Olinto and Gigante, 2015). Parental SES and the adolescents' educational level influence the adolescents' personality, modelling of parents and peers, and received peer pressure, which can cause smoking and drinking (e.g. Cooper, Lhussier, Shucksmith and Carr, 2017; Motta et al., 2015). Early use of alcohol and tobacco by adolescents is problematic because early onset is related to an increased chance for substance dependence (e.g. Anthony, Warner and Kessler, 1994; Holmes, 2010; Robins and Przybeck, 1985). Thereby, drinking and smoking are health risk behaviours that can impact long-term health and wellbeing of individuals. Smoking is related to diseases, such as cancer, lung- and cardiovascular diseases, and early alcohol use is related to self-harm, unintentional injuries to the self and others, social problems, academic underachievement, mood disorders and risky sexual behaviours (e.g. Cooper et al., 2017; Hoof, Lely, Pereira and Van Dalen, 2010; Melotti, Heron, Hickman, Macleod, Araya and Lewis, 2011).

Individuals with a weaker educational level and SES tend to engage in health risk behaviours, such as smoking, more often than individuals with a higher SES and educational level (e.g. Hiscock, Bauld, Amos, Fidler and Munafò, 2012; Melotti et al., 2011; Motta et al., 2015). Additionally, it has been found that effortful control may influence SES and substance use (e.g. Miller, Yu, Chen and Brody, 2015; Moffit et al., 2011). Inconsistency in the literature about SES in relationship with adolescent substance use exist. Alcohol and tobacco use in relation to SES among adolescents may be different and less well understood than adult drinking and smoking behaviour (Hanson and Chen, 2007a). Thereby, most studies focus on childhood or adulthood, whereby SES is measured as a stable construct instead of a dynamic construct. Therefore, in this study will be focused on social mobility which refers to the possible change from parental SES to own acquired SES. The central question is: does social mobility predict adolescent smoking and drinking over time?

Socioeconomic Status and Tobacco Use

SES influences the social and cultural context of individuals and can affect how a person views and interacts with the world (e.g. Destin, Rheinsmidt-Same and Richeson., 2017;

Melotti et al., 2011). Meaning is given to SES through social environmental indicators such as education, wealth, income and social class of the individual (Melotti et al., 2011). People with weaker SES tend to have more exposure to stressors, such as less resources, money, knowledge, power and social connections. A lack of these resources has been related to risk factors that influence health, such as less access to health care, smoking and stressful life conditions (e.g. Destin et al., 2017; Phelan, Link, Diez-Roux, Kawachi and Levin, 2004). In developed countries, the prevalence of smoking is higher among individuals with a lower SES (Hiscock et al., 2012). Low SES individuals may live in disadvantaged environments where more people smoke, therefore they may face higher exposure to tobacco harms. Thereby, low SES individuals are also less likely quit smoking because tobacco control interventions and policies are less effective for people in low SES groups (Hiscock et al., 2012).

Empirical evidence shows a negative relationship between SES and tobacco use. Melchior, Moffit, Milne, Poulton and Caspi (2007) found that children who experience socioeconomic disadvantage are at higher risk of using tobacco in young adulthood. Also, Melotti et al. (2011) did conduct a cohort study among 13-year-old adolescents and found that tobacco use was associated with a weaker SES. Kuipers, Nagelhout, Willemsen and Kunst (2013) found, for Dutch adolescents, that the prevalence rate of smoking was higher among individuals who attained lower educational levels. In contradiction, Hanson and Chen (2007a) conducted a cross-sectional research on SES and adolescent substance use. They found that high SES adolescents reported more tobacco use than low SES adolescents. A critical point with respect to the latter study is that the sample size was relatively small (N=113).

According to the available literature, it is plausible to assume an existing negative relationship between SES and adolescent smoking. This negative relationship may be affected by the fewer resources available for people with a lower SES who may live in disadvantaged environments.

Socioeconomic Status and Alcohol Use

Youth with a high SES might consume more alcohol than low SES adolescents. During the transition from high school to university or college, most adolescents move away from home and find themselves in an environment where they are exposed to several behavioural risks, including heavy alcohol use. While adolescents who attend college or university are likely to move into an environment with a drinking culture, non-college peers do not (Fromme, Kruse and Corbin, 2008). Therefore, the educational environment might reinforce drinking behaviour of adolescents and as such strengthen an association between alcohol use and higher SES.

Empirical evidence does not reveal a clear positive relationship between SES and adolescent alcohol use. Fromme et al. (2008) have shown in their cohort study that the overall rate of adolescents consuming alcohol increases during the transition from high-school to college. Goodman and Huang (2002) found in their cross-sectional study a positive relationship between adolescent SES and adolescent alcohol use. Also, Melotti et al. (2010) found in their longitudinal cohort study a positive relationship between adolescents' early SES and alcohol use. In contradiction, Yu and Stiffman (2007) found in their longitudinal study about environmental predictors for adolescent alcohol abuse, use and dependence, that a lower SES was related to more alcohol use among adolescents. But, Hanson and Chen (2007b) concluded in their systematic review that most of the reviewed studies included in their research did not find a relationship, and among the studies that did find a pattern, half of them did find a positive relationship and half of them did find a negative relationship.

These previous findings (e.g. Fromme et al., 2008; Hanson and Chen, 2007b; Melotti et al., 2010) suggest that the relation between SES and drinking among adolescents is far from clear. In current study, alcohol and smoking behaviour in relation to SES will be evaluated to get a better understanding of how parental SES and social mobility of adolescents affect their alcohol and tobacco use between 11 and 16 years old.

Social Mobility and Substance Use

Social mobility refers to changes that can be made in attaining SES (Destin et al., 2017). Nowadays it is likely that adolescents can attain their own status, which may deviate from the SES of their parents. Three social mobility trajectories are possible. First, the adolescent and parental SES remain equal. Second, there may be upward social mobility, where the child attains a higher SES than the parents. And third, downward social mobility, where the child attains a lower SES than the parents (e.g. Destin et al., 2017; Motta et al., 2015).

The social selection theory (Mackenbach, 2012) proposes that traits and dispositions of parents can influence their own and their child's SES. The SES of the child is influenced by the parental SES, income and academic achievement. But the SES of the child in later life, is also influenced by individual characteristics as personality and intelligence. Individual differences, transmitted to children from parents, such as intelligence and self-control, facilitate accumulation of social advantages to achieve a higher SES (upward mobility) (e.g. Corcoran and Adams, 1997; Mackenbach, 2012).

Research on intergenerational social mobility has shown that downward mobility predicts behavioural risk factors (e.g. Collins, Rankin, and David, 2015; Kuntz and Lampert, 2013). Kuntz and Lampert **(**2013) examined the relationship between adolescent smoking and

intergenerational educational mobility in their cross-sectional study. They found that adolescent boys with low education and adolescent boys with downward social mobility had an increased risk of being a smoker. Among adolescent girls, only those with a low education, had an increased risk of smoking. Thereby, educational upward mobility was found to be a protective factor for becoming a smoker in adolescence (Kuntz and Lampert, 2013). Grunewald et al. (2012) concluded in their longitudinal study that downward social mobility was related to behavioural risk factors, including smoking and light alcohol consumption. Also, Karvonen, Rimpelä and Rimpelä (1999) conducted a longitudinal follow-up study among adolescents in Finland to examine the relation between social mobility and health related behaviours. They found that health risk behaviours, including smoking, were associated with downward social mobility, while upward social mobility improved health promoting behaviours (e.g. a healthy diet). However, with respect to alcohol use the authors found no association with adolescents' social mobility.

The available literature suggests that upward social mobility protects youth from engaging in substance use, while downward social mobility may increase the risk of using substances. Therefore, it is plausible to assume that social mobility predicts adolescent tobacco and alcohol use.

The Moderating Effect of Effortful Control

The social selection theory and the theory of personal characteristics proposes that, besides parental SES and educational level, personal characteristics (i.e. effortful control) are important determinants for health-related behaviours. These personal characteristics may act as a protective or as a promotive factor (e.g. Corcoran and Adams, 1997; Mackenbach, 2012).

Empirical evidence suggests a possible main effect of effortful control on substance use. Miller et al. (2015) found in their five-wave study among adolescents aged 17-22, a significant negative main effect of self-control in relation to substance use. They conclude that higher self-control forecasts lower rates of alcohol and cigarette use. Also, Moffit et al. (2011) found in their life-course study among siblings, that low childhood SES was associated with an increased risk of substance use and substance dependence in adulthood. Thereby, they found that adolescent siblings with lower self-control attained in riskier health behaviours, such as smoking at an early age. Moffit et al. (2011) concluded that self-control predicts risk behaviours, including smoking.

In addition, Lengua, Bush, Long, Kovacs and Trancik (2008) found in their cohort study among children aged 8-15 that low parental SES (e.g. low income and low education), was a predictor of children's level of internalizing and externalizing problems. Thereby they

found that effortful control moderated this relationship. Low effortful control was a promotive factor on the relationship between socioeconomic risk and problems, while high effortful control was a buffering factor (Lengua et al., 2008). Even though Lengua et al. (2008) did focus on internalizing and externalizing problems, it is plausible to assume that effortful control is a moderator for the relationship between social mobility and alcohol and tobacco use, because internalizing and externalizing problems are predictors of early onset of substance use in adolescence (King, Lacono and McGue, 2004).

Derived from the empirical evidence, effortful control may moderate the relationship between social mobility and adolescent smoking and drinking. Weak effortful control might increase negative effects of social mobility on substance use, whereas high effortful control might protect against negative effects.

Current Study

The predictive effect of social mobility on alcohol and tobacco use among Dutch adolescents by including adolescents who did not drink or smoke at the baseline will be examined in this study. In addition, the moderating role of effortful control will be considered (Figure 1). The following hypotheses are derived from the literature:

H1: Parental SES predicts adolescent tobacco use;

H2: Social mobility predicts adolescent tobacco use;

H3: Parental SES predicts adolescent alcohol use;

H4: Social mobility predicts adolescent alcohol use;

H5: Effortful control moderates the relationship between social mobility and adolescent tobacco use;

H6: Effortful control moderates the relationship between social mobility and adolescent alcohol use.

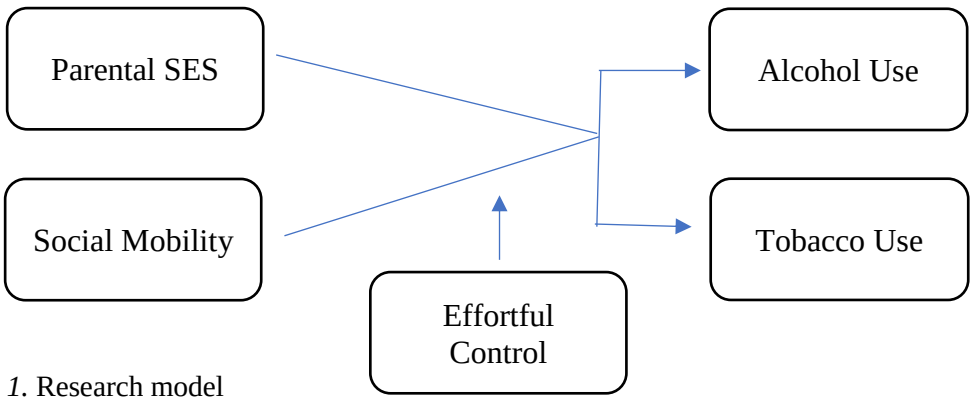

Figure 1. Research model

Methods

Study design

Data was used from the first, second, and third wave of the TRacking Adolescents' Individual Lives Survey (TRAILS). TRAILS is a prospective cohort study of Dutch 10-12-year-old pre-adolescents until age 24 (De Winter, Oldehinkel, Veenstra, Brunnekreef, Verhulst and Ormel, 2005). The main purpose of the TRAILS dataset is to examine adolescents and young adults their psychological and physical development and how this influences their behaviour (TRAILS, n.d.).

Procedure

The TRAILS-data is collected including multiple information sources such as self-report, parent, teacher and classmates report. The assessment of the TRAILS-data took place at different locations depending on the residence of the participants (i.e. at school), and under the guidance of a research assistant who received extensive training to ensure a standardized procedure for all participants. The Dutch Central Committee on Research Involving Human Subjects approved the TRAILS-study. Participants signed informed consent was obtained and the confidentiality of the study was emphasized (e.g. Boelema et al., 2016; De Winter et al., 2005; Peeters, Oldehinkel and Vollebergh, 2017).

Participants

Participants were recruited from primary schools in five municipalities in the North of the Netherlands. Within these municipalities, 122 primary schools participated in the TRAILS study. The first wave (T1) was conducted in 2000-2001 among 2.230 adolescents (M_{age} =11.1 years, *SD*=.59, 49.2% male). The second wave (T2) was conducted in 2003-2004 (M_{age} = 13.6 years, *SD*=.53, 48.8% male) among 2.146 adolescents. The third wave (T3) was conducted among 1.816 adolescents in 2005-2007 (M_{age}=16.3 years, *SD*=.73, 47.7% male; Table 1) (e.g. Boelema et al., 2016; Peeters et al., 2017).

The percentage of participants who dropped out from T1 to T2 was 3.6%. From T2 to T3 the dropout rate was 15.5%. Attrition analyses were done to get insight about the dropouts, and independent sample *t*-tests were done to identify the dropout rates. The missing's of age at wave 3 were compared to the missing's of SES (T1), effortful control (T1) and level on the education-ladder (T2, T3). The *t*-test for SES was statistically significant, indicating that there was a difference between the SES of the missing group and the present data (t (2186) = 8.79, $p < .001$). The *t*-test was also significant for the level of educational, indicating a higher difference between the educational level of the missing group and the present group (t_{T2} (2023) = 6.45, $p < .001$; t_{T3} (567.64) = 6.83, $p < .001$). The *t*-test was not significant for

effortful control (t (2049) = .042, p =.97). So, participants who did not finish the questionnaire had a weaker SES and were lower educated than the participants who did finish the questionnaire.

Measures

Alcohol use

To select the dataset with non-drinking adolescents at the baseline, participants were asked if they ever consumed alcohol in their lives at T1. Adolescents could answer from a five-category scale ranging from 'never' to '7 times or more'. Adolescents who did not drink at the baseline were included in the dataset (see also strategy of analysis). At T3, adolescents were asked how many times they drank alcohol within the last four weeks. The answer scale contained 13 categories ranging from 0 to 40 or more (Peeters et al., 2017).

Smoking behaviour

In the first wave, adolescents were asked to indicate whether they had ever smoked a cigarette in their lives. The answer scale had five categories ranging from "never" to "7 times or more". Adolescents who never smoked at the baseline, were included in the dataset (see also strategy of analysis). At the third wave, adolescents were asked again whether they have ever smoked. Thereby adolescents were asked to indicate the number of cigarettes they smoked per day during the last four weeks. The answer scale contained 7 categories and the response categories ranged from "never smoked" to "more than 20 cigarettes a day". The other response categories distinguished adolescents who smoked on occasion (e.g. once a week or one a day) to regularly (e.g. 2-20 cigarettes a day; Peeters et al., 2017).

Social Mobility

Social mobility was computed by combining parental SES (T1) and the score on the education-ladder (T3). The education-ladder was measured on a scale from 0 to 10 (GION, 2001). At T3 adolescents were on average 16.3 years old, which means that they would approximately be in fourth class of high school. The education-ladder is a weighing instrument which compares the different educational levels relative to age. The higher the score, the higher the level and years of education (GION, 2001). SES was measured by combining parental education, parental occupation and the income at T1 (α =.84).

By combining parental SES and the adolescents' education, social mobility was computed into six groups: from low parental SES to low score on education-ladder (low-low), from low parental SES to high score on the education-ladder (low-high), from parental middle SES to low level on the education-ladder (middle-low), from parental middle SES to high score on the education-ladder (middle-high), from high parental SES to a high score on the

education-ladder (high-high) and from high parental SES to a low level on the education-ladder (high-low). Low-low and high-high represented stable mobility, middle-high and low-high represented upward mobility and middle-low and high-low represented downward mobility.

Effortful control

Effortful control was measured at T1 (age 11) and was assessed through the child version of Early Adolescent Temperament Questionnaire revised (EATQ-R; Putnam, Ellis and Rothbart, 2001). A Dutch translated version of the EATQ-R was used (Oldehinkel, Hartman, De Winter, Veenstra and Ormel, 2004). 13 items of this scale were selected to measure self-reported effortful control (α = 0,69). Items contained questions like: "It takes me a lot of effort to get things done in time". The items had five response categories ranging from "almost never true" to "almost always true". The higher the score, the higher the indication of effortful control (Oldehinkel et al., 2004).

Strategy of Analysis

Statistical Package for the Social Sciences (SPSS) version 24 was used to analyse the TRAILS data. Prior to the data analysis the variables social mobility (see measures), alcohol and tobacco use were computed. First, the descriptive statistics and the Pearson's correlations among the variables: family SES (T1), education adolescent (T3), smoking (T3), alcohol (T3), effortful control (T1) and gender (T1) were analysed. Second, the dataset was split into two datasets, one for alcohol consumption (N=1518) and one for tobacco use (N=1899). Adolescents who already smoked (N=302) or drank alcohol (N=681) at the baseline were removed from the sample. Third, both datasets were cleaned and checked for meeting the assumptions. Outliers were observed and inspected but were not removed from data as variance in drinking and smoking does exist in this relatively young group of adolescents (Peeters et al., 2017).

Two hierarchical linear regression analyses, one for alcohol and one for smoking, were executed to analyse if a relationship between social mobility group and drinking or smoking exists. In step 1, gender was added as control variable (Table 2) and SES was separately being analysed as predictor. Prior to step 2, parental SES was removed from the analysis to avoid multicollinearity with social mobility. In step 2, the main effects of social mobility and effortful control on drinking and smoking were analysed. In step 3, interaction terms of social mobility group with effortful control were made to test if effortful control had a moderating influence on the main effect.

Results

Descriptive Statistics

Table 1 includes descriptive information on the main variables in this study for the two subsamples and the sample in total. In Table 2, descriptive statistics for the risk behaviours, smoking and drinking, are presented. Pearson correlations revealed that alcohol and smoking had a positive association with each other. Thereby, drinking tends to be higher among boys, while smoking tends to be higher among girls. Between effortful control, and alcohol and tobacco use, negative correlations were found. Weaker effortful control was positively associated with drinking and smoking. Moreover, a negative association between social mobility and smoking was found, indicating that downward social mobility (weaker level on the education-ladder than parental SES) is associated with smoking. No correlations were found for social mobility and alcohol use.

Table 1

Demographic information and descriptive statistics of the variables for each dataset

	Total Sample	**Non-Drinkers**	**Non-Smokers**
N (T1)	2230	1518	1899
% boy	49.2	43.7	47.8
Mean Age T1 *(SD)*	11.11 *(.56)*	11.06 *(.54)*	11.09 *(.55)*
Parental SES T1 *(SD)*	-.05 *(.80)*	-.02 *(.80)*	-.001 *(.80)*
Effortful Control T1 *(SD)*	3.58 *(.54)*	3.64 *(.54)*	3.62 *(.54)*
Education-Ladder T3 *(SD)*	6.88 *(1.57)*	6.94 *(1.60)*	6.98 *(1.59)*
Smoking T3 *(SD)*	2.78 *(5.49)*	2.25 *(5.1)*	2.27 *(5.04)*
Drinking T3 *(SD)*	4.55 *(6.74)*	3.85 *(5.87)*	4.32 *(6.54)*

Table 2

Pearson correlations for all study variables of the total sample

Measure	**M *(SD)***	**1**	**2**	**3**	**4**	**5**
(1) Boy (%)	49.2					
(2) SES T1	-.05 *(.80)*	-.03				
(3) Education Level T3	3.94 *(1.34)*	-.10**	.472**			
(4) Effortful-Control T1	3.59 *(.54)*	-.09**	.083**	.190**		
(5) Alcohol T3	4.55 *(6.74)*	.11**	.002	-.048	-.088**	
(6) Smoking T3	2.78 *(5.49)*	-.07**	-.206**	-.258**	-.125**	.265**

Note. *Higher scores indicate higher/better control, SES, educational level, alcohol use and smoking. ** p = < .01 (2-tailed).*

Main Results

Tables 3 and 4, show the results of the hierarchic linear regression analyses. Table 3 shows the results for tobacco use. In step 1, gender at T1 was added as control variable (see Table 2). Gender did not predict smoking. Thereby, parental SES was added in step 1 to look at the effect of parental SES on smoking. Parental SES was a significant predictor of the onset of the smoking behaviour and the smoking behaviour (B=-1.03, SE=.19, p <.001). Weaker parental SES predicted higher tobacco use among adolescents at their onset of smoking.

Prior to step 2, parental SES was removed from the analysis to avoid multicollinearity with social mobility. In step 2, effortful control and social mobility were inserted in the analysis. The social mobility groups were added as dummy variables with the reference group: from high parental SES to high child education status. Significant negative associations were found for the downward social mobility groups middle-low (B=1.84, SE=.41, p<.001) and high-low (B=1.65, SE=.71, p=.02). For the equal social mobility group, low-low, negative association were also found (B=3.13, SE=.50, p <.001). Downward social mobility is associated with higher tobacco use, in comparison to the high-high reference group. No significant relations were found for the upward social mobility groups middle-high and low-high, which indicates that upward social mobility is not related with higher tobacco use. In addition, effortful control was significant related with smoking (B=-.78, SE=.28, p=.006) and predicted the onset of smoking and the smoking behaviour of the adolescent.

In step 3, the social mobility group interaction with the centered effortful control variable was added. No significant interaction effects were found, indicating that effortful control does not have a differential impact on the relation between social mobility and smoking.

Table 3

Smoking (T3) predicted by social mobility groups (T1-T3) controlling for sex and smoking at T1

		B	***SE B***	***β***
Step 1	Sex (T1)	-.58	.30	-.06
	Parental SES (T1)	-1.03***	.19	-.16
Step 2	Low-low vs. high-high	3.13***	.50	.22
	Low-high vs. high-high	.94	.660	.05
	Middle-low vs. high-high	1.84***	.41	.02
	Middle-high vs. high-high	.18	.41	.02
	High-low vs. high-high	1.65*	.28	.07
	Effortful control (T1)	-.78**	.28	-.08
Step 3	Low-high x e.c.	-1.20	.89	-.05
	Middle-low x e.c.	-.07	1.15	-.002
	Middle-high x e.c.	.85	.81	.04
	High-low x e.c.	.33	.81	.02
	High-high x e.c.	-.42	1.35	-.01

Note. SES was analysed as predictor separately from the other variables.

R^2 = .003 for Step 1, ΔR^2 = .065 for Step 2 (significant), ΔR^2 = .005 for Step 3 (n.s.)

**p* = <.05, ***p* = <.01, ****p* = <.001.

Table 4 presents the results for alcohol (T3). In step 1, gender was added as control variable (see Table 2). No significant effect was found for gender, which means that gender did not predict adolescent drinking. Thereby, parental SES was added to look at the effect of parental SES on alcohol use. No predicting effect of parental SES on alcohol use was found.

Prior to step 2, parental SES was removed from the analysis to avoid multicollinearity with social mobility. In step 2, effortful control and social mobility were added to the analysis. The social mobility groups were added as dummy variables. The reference group was the high-high group. No significant effects were found for social mobility or effortful control, indicating that social mobility and effortful control did not predict adolescent drinking. In step 3, the interaction of the social mobility groups with the centered effortful control variable were added. No significant relations were found, which means that effortful control had no moderating influence on the relationship between social mobility and alcohol.

Table 4

Alcohol (T3) predicted by social mobility groups (T1-T3) controlling for gender and alcohol at T1

		B	***SE B***	***β***
Step 1	Sex (T1)	.71	.38	.06
	Parental SES (T1)	-.05	.22	-.01
Step 2	Low-low vs. high-high	.34	.62	.02
	Low-high vs. high-high	-.39	.79	-.02
	Middle-low vs. high-high	.44	.54	.03
	Middle-high vs. high-high	.07	.52	.01
	High-low vs. high-high	-1.08	.88	-.04
	Effortful control (T1)	-.64	.35	-.06
Step 3	Low-low x e.c.	.43	1.14	.02
	Low-high x e.c.	.01	1.30	.00
	Middle-low x e.c.	-.82	1.03	-.03
	Middle-high x e.c.	-1.09	1.00	-.05
	High-low x e.c.	1.08	1.59	.02

Note. SES was analysed as predictor separately from the other variables.

R^2 = .004 for Step 1, ΔR^2 = .008 for Step 2 (n.s.), ΔR^2 = .003 for Step 3 (n.s.)

* *p* = <.05, ** *p* = <.01, *** *p* = <.001.

Discussion

The aim of this longitudinal study was to test whether alcohol and tobacco use of adolescents (age 11 to 16) are predicted by the social mobility of the adolescent. Parental SES turned out to be a predictor of smoking, but it does not predict alcohol use. Parental SES predicted a stronger increase in smoking among lower SES groups. Besides parental SES, downward social mobility of the adolescent appeared to be a strong predictor for smoking and for the onset of smoking, but not for drinking. This means that the negative footprint of parental SES (e.g. low parental SES) disappears as soon as the adolescent attains a higher SES.

SES, Social Mobility and Smoking

The first hypothesis, parental SES predicts tobacco use of the adolescent, was accepted. This finding is in line with Melchior et al. (2007), who found that children with a weaker parental SES are at higher risk of using tobacco in young adulthood. Parents with a weaker SES tend to have less resources, knowledge, money and social connection that could protect their health

(Phelan et al., 2014). Adolescents tend to model their parents, which means that they copy the behaviour of their parents. A weaker SES may thus influence parents and adolescents' their attitude and behaviour towards smoking, but also their knowledge of possible health consequences (Mathur, Erickson, Stigler, Forster and Finnegan, 2013).

The second hypothesis, social mobility predicts tobacco use, was accepted. Downward social mobility predicts smoking behaviour and the onset of smoking. This finding is in line with Kuipers et al. (2013), who found that the prevalence rate of smoking is higher among individuals with lower educational levels. Kuipers et al. (2013) explain that tobacco control policies influenced this finding, because campaigns against smoking have been most beneficial to high educated adolescents and high SES parents. Thereby, low educated adolescents tend to view smoking as a way of meeting people, they experience positive norms and social pressure towards smoking, while higher educated adolescents do not (De Vries, 1995).

SES, Social Mobility and Alcohol Use

The third hypothesis was that parental SES predicts adolescent alcohol use. The hypothesis was rejected because no effect was found, indicating that SES does not predict adolescent alcohol use and the onset of alcohol use. This finding is line with the results of Hanson and Chen (2007b), who concluded in their systematic review that a relationship between SES and drinking might not be present. Inconsistency during the literature research was already found. The finding in this study is in contrast with Fromme et al. (2008) their findings. They did find a relationship between alcohol and SES. A possible difference between Fromme et al. (2008) their study and this study is the mean age of the samples. Fromme et al. (2008) included a sample of older adolescents who were 17-19 and attained university. Within Fromme et al. (2008) their sample the drinking culture in university might have affected the positive relationship they found between SES and alcohol. Further, Yu and Stiffman (2007) their results are also in contrast with the results in this study. Yu and Stiffman (2007) found that a lower SES was related to more alcohol use among adolescents. A possible difference compared to this study is their study sample that contained 401 American Indian youths, which differs in size and nationality from this studies sample of 2.230 Dutch youths.

The fourth hypothesis was that social mobility predicts adolescent drinking. This hypothesis was rejected because no effect was found, indicating that social mobility did not have a predicting value for adolescent alcohol use. The available literature suggested that downward social mobility was related to risk behaviours (e.g. Grunewald et al., 2012;

Karvonen et al., 1999). However, the scope of these studies was not specifically alcohol use, but risk behaviours in general.

The fact that no predicting effect was found for SES and social mobility on alcohol use among adolescents might be explained by Hanson and Chen (2007b) their systematic review in which they found that there may be no relationship between SES and drinking. They explain that the association between SES and alcohol use may be absent because adolescents spend less time in home during adolescence. It is possible that the influence (i.e. peer social status) of peers, who can be in the same sports teams, school or live in the same neighbourhood in example, may outweigh the impact of parental SES during adolescence. The impact of parental SES, which is an assigned status, may be too distal to influence health behaviour choices, as adolescents gain independence. Whereas peer status, an earned status, may better explain the placement of the adolescent in a social hierarchy. This may result in a relative equality of alcohol use across the SES spectrum during adolescence (Hanson and Chen, 2007b).

Given these points, it may be possible that no effect was found because adolescent alcohol use may be stronger predicted by peer status than by parental SES and social mobility (e.g. own educational level) (Hanson and Chen, 2007b; Payne, Lee, Giletta and Prinstein, 2016).

The Difference between Alcohol and Tobacco Use

A clear difference was found between drinking and smoking, suggesting that the influence of parental SES and social mobility is different for alcohol than for smoking in adolescence.

First, the different patterns for smoking and alcohol might be explained by Wen, Tsai, Cheng, Hsu, Chen and Lin (2005), who found that smoking is greater influenced by parent behaviour (modelling) and parent attitudes than by peer influence. Low SES parents might model smoking in front of their children while they do less with alcohol (Hanson and Chen, 2007b). Peer status and influence may be an important predictor for both alcohol and smoking, while parental SES may have a stronger influence on smoking (Hanson and Chen, 2007b). Therefore, alcohol use might be less intergenerational transmitted than smoking.

Second, alcohol is culturally accepted among most western societies, while smoking is not. Acceptance of smoking decreased between 2005 and 2014 among the Dutch society (Hummel, Willemsen, De Vries, Monshouwer and Nagelhout, 2017). People accept higher risks for the use of alcohol than for other risk behaviours, like smoking (Rehm, Lachenmeier and Room, 2014). Thereby, alcohol is not internationally regulated as addictive substance, and the risks of alcohol may not be fully understood by the society, while for smoking it is. In

example, 36% of the population in Europe thought that alcohol could increase the risk of cancer (Rehm et al., 2014).

In sum, alcohol use seems to be most influenced by peers, while for smoking this is for peers, and mostly parents. Thereby, drinking seems to be a normative behaviour among all SES groups and is socially accepted in society, while the acceptance of smoking has declined. There is support for the statement that weaker SES is related to health risk behaviours, but this might not be the case for the use of alcohol among adolescents. Therefore, alcohol consumption might not be as SES dependent as smoking.

Effortful Control, Social Mobility and Smoking

The fifth hypothesis, effortful control moderates the relationship between social mobility and smoking, was rejected. Effortful control was neither a promotive nor a protecting factor for the tobacco use and onset of smoking. Nevertheless, a negative main effect of effortful predicting smoking behaviour was found.

The main effect of effortful control on smoking, may be explained by the Duckworth and Steinberg (2015) who wrote that adolescents with weaker effortful control are less able to control impulses, regulate emotions, thoughts and actions. Impulsivity may bring short-term gratification at the expense of longer term goals. Adolescents with weaker effortful control, may have higher impulsivity, which causes them to be more vulnerable to the temptation of engaging in rewarding and addictive behaviours, such as smoking (Duckworth and Steinberg, 2015).

No moderation effect for effortful control on the predicting relationship of social mobility on smoking was found in this study. This contrasts with the social selection theory (Mackenbach, 2012), which proposes that individual characteristics, like effortful control, could accumulate social advantages, which diminish or strengthen the influence of parental SES. It might be that smoking is greater influenced by parents then by peers, while effortful control is negatively related to susceptibility to peer influences (Meldrum, Miller and Flexon, 2013; Wen et al., 2015). Therefore, it may be that the influence of parental SES diminishes the influence of effortful control.

Effortful Control, Social Mobility and Alcohol Use

Hypothesis six was rejected because no moderating effect of effortful control on the relationship between social mobility and drinking was found. Since no main effect was found between social mobility and alcohol use, it is not plausible that a moderation effect of effortful control could have occurred. Thereby, no main effect for effortful control predicting adolescent alcohol use was found.

The finding that effortful control did not predict drinking contrasts with Miller et al. (2015) their study in which they did find an effect. The difference between these findings might be because Miller et al. (2015) assessed self-control from age 17-20, whereas effortful control in this study was assessed at age 11. During adolescence, motivational and emotional connections in the brain develop. The connectivity between these regions becomes stronger with age and experience, so the capacity of effortful control, driven by emotional behaviour, will develop stronger in years and experience (Casey and Caudle, 2013). Therefore, effortful control might be assessed too early in adolescence in this study.

Thus, effortful control was no moderator, which may be explained by the probability that alcohol use is socially accepted among all SES groups, so no differences are present between SES groups. Thereby, effortful control may have been assessed while the capacity of the adolescents' effortful control might have been the weakest.

Strengths and Limitations

This research has a few limitations. First, the measurements of effortful control, alcohol and tobacco were based on self-report. Despite self-report measures being common used and considered adequate, it is possible that answers are underestimated due to social desirability bias. In example, individuals who heavy drink, tend to underestimate their consumption (Bosque-Prous et al., 2017). To reduce the chances of social desirable answers future research could apply parent- or teacher report, which are more objective, to diminish the effects of social desirability or youths their own possible distorted view on reality. A second limitation is the generalizability of the sample. Attrition showed that adolescents with weaker SES were more likely to dropout the study. This implies that the sample at T3 (age 16) might have included relatively more adolescents from high SES than the original sample at baseline T1 (age 11). Third, alcohol use was measured by the times the adolescent drank alcohol in the last four weeks. The times of consuming alcohol in the last month and the frequency of consumed alcohol are not the same. Future research could use the quantity by frequency measure (Sobell and Sobell, 1995), which estimates the total amount of alcohol consumptions over a certain period (Peeters et al., 2017). Fourth, the adolescents included were relatively young and might not have finished their course of attaining own SES yet. Therefore, social mobility can change as adolescents grow older, which could also influence the results.

Conclusions and Implications

In this study was revealed that SES and downward social mobility are important predictors in adolescent smoking behaviour. The weaker SES at age 11, the higher the smoking behaviour at age 16. Thereby, downward social mobility predicts higher tobacco use. The effect of

parental SES on smoking diminishes when the adolescent gains in SES. In addition, adolescents with weaker effortful control are at higher risk of using tobacco. Neither social mobility, nor effortful control were in relation with adolescent alcohol use.

The results suggest that social mobility and SES have a different impact on drinking and smoking. Moreover, parental SES influences adolescents' substance use behaviour, however adolescents own education level (i.e. social mobility) appears to either have a positive or negative effect, depending on the direction of social mobility, on the smoking behaviour. This suggest that adolescents' own attained status might be equally important, and perhaps even more important in predicting smoking and the onset of smoking, than parental SES. For future research it is important to distinguish between risk taking behaviours, because predictors for alcohol use might be different than for tobacco use. Future research could scope on other possible mechanisms that may predict adolescent alcohol use.

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