

The Effect of Parental Alcohol Use on Alcohol Use in Dutch Adolescents: The Influence of Parental Monitoring

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Thesis based on Existing Data (TED) (201800140)

Youth studies 2022-2023

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Date: June 9, 2023

This thesis has been written as a study assignment under the supervision of a Utrecht University teacher. Ethical permission has been granted for this thesis project by the ethics board of the Faculty of Social and Behavioral Sciences, Utrecht University, and the thesis has been assessed by two university teachers. However, the thesis has not undergone a thorough peer-review process so conclusions and findings should be read as such.

Abstract

The present study investigated to what extent parental monitoring influences the relationship between parental alcohol use and adolescent alcohol use and distinguished between effects of maternal and paternal alcohol use as well as between effects of maternal and paternal monitoring. This is the first study to investigate the effect of parental monitoring on the relationship between parental and adolescent alcohol use. Additionally, previous studies did not often distinguish between maternal and paternal monitoring. This study used longitudinal data from the Tracking Adolescents' Individual Lives Survey (TRAILS) ($N=814$). The results showed a significant positive relationship between maternal and adolescent alcohol use. There was no significant relationship found between paternal and adolescent alcohol use. Furthermore, parental monitoring did not influence the relationship between parental and adolescent alcohol use. In order to target interventions specifically, it is important to further investigate which factors can weaken the relationship between maternal and adolescent alcohol use in particular, as maternal alcohol use was found to be the strongest predictor of adolescent alcohol use according to the current study.

Keywords: adolescents, alcohol use, TRAILS, parental alcohol use, parental monitoring

De huidige studie onderzocht in welke mate monitoring door ouders de relatie tussen alcoholgebruik door ouders en alcoholgebruik door adolescenten beïnvloedt en maakte onderscheid tussen effecten van alcoholgebruik door moeders en vaders en tussen effecten van monitoring door moeders en vaders. Dit is de eerste studie waarin het effect van ouderlijke monitoring op de relatie tussen alcoholgebruik door ouders en adolescenten is onderzocht. Bovendien maakten eerdere studies niet vaak onderscheid tussen monitoring van moeders en vaders. Deze studie gebruikte longitudinale gegevens van de *Tracking Adolescents' Individual Lives Survey* (TRAILS) ($N=814$). De resultaten lieten een significante positieve relatie zien tussen alcoholgebruik van moeders en adolescenten. Er werd geen significante relatie gevonden tussen het alcoholgebruik van de vader en de adolescent. Bovendien had ouderlijke monitoring geen invloed op de relatie tussen alcoholgebruik door ouders en adolescenten. Alcoholgebruik door moeders bleek de belangrijkste voorspeller voor alcoholgebruik door adolescenten te zijn. Om interventies te specificeren is het belangrijk om verder te onderzoeken welke factoren met name de relatie tussen alcoholgebruik door moeders en adolescenten zouden kunnen verzwakken, aangezien alcoholgebruik door moeders volgens het huidige onderzoek de sterkste voorspeller van alcoholgebruik door

adolescenten bleek te zijn.

Sleutelwoorden: adolescenten, alcoholgebruik, TRAILS, ouderlijk alcoholgebruik, ouderlijk toezicht

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Introduction

Dutch adolescents are no longer called “the drunkards of Europe” (Jellinek, 2021), but it is alarming that the remaining percentage of alcohol consumption ever in life among students aged 12 to 16 has stagnated. The percentage showed a strong decline between 2003 (84%) and 2015 (44%) (GGD GHOR, 2020), but has hardly changed between 2015 and 2019 (Rombouts et al., 2020). Adolescent alcohol use can lead to many detrimental outcomes such as poor school performance, depression, aggression, delinquency, and brain damage (Kamps, 2022).

Parents have shown to be important stakeholders in alcohol-specific programs and alcohol prevention strategies to reduce adolescent alcohol use (Bo et al., 2018). Parents can have a big influence on their children's alcohol consumption through the way they raise their children, but also through their own behavior (Kuntsche & Kuntsche, 2016). Longitudinal research showed that parental alcohol use predicts adolescent alcohol use at a later time (Alati et al., 2014; Mahedy et al., 2018).

In order to target interventions specifically, it is useful to know differences between maternal and paternal effects on adolescent alcohol use and to know which factors influence the relation between parental and adolescent alcohol use. Parental monitoring could be such an influencing factor. Parental monitoring is defined by Villarreal and Nelson (2018) as “the degree to which parents monitor their adolescent’s behavior, whereabouts, and friend groups” (p. 3628). The aim of this study is to investigate to what extent parental monitoring influences the relationship between parental and adolescent alcohol use and to examine differences between maternal and paternal effects. These possible new insights can be useful for designing new interventions to reduce alcohol use among adolescents.

Theoretical Substantiation

Parental alcohol use and adolescent alcohol use

The social learning theory (Bandura, 1977) provides an explanation for the positive relationship between parental and adolescent alcohol use. According to this theory, individuals learn new behaviors by observing, interacting with, and imitating others, which is also known as modeling (Vermeulen-Smit et al., 2012). When adolescents observe their parents drinking alcohol, they will eventually develop positive cognitive representations towards alcohol use and imitate their parents’ drinking behavior.

Bandura’s theory (1977) is in line with the social norm theory, which states that people’s behavior is influenced by how others think and act (Lynch et al., 2015). Especially adolescents are influenced by a desire to conform to the view of important others, like parents

(Lynch et al., 2015). Parental transmission of positive alcohol norms to their children can lead to increased adolescent alcohol use (Brody et al., 2000).

The influence of parental monitoring

Parental monitoring has shown to be a family process that strongly relates to many adolescent behaviors. Less parental monitoring can lead to more adolescent risk behavior, whereas more parental monitoring can protect adolescents from risk-taking behavior (Bray et al., 2022; Carrol et al., 2016). When parents monitor their adolescent's activities, they stay involved in their adolescent's lives without physically being there (Lionetti et al., 2019).

Much previous research identified parental monitoring as a protective factor for adolescent alcohol use (Kopak et al., 2011; Villarreal & Nelson, 2018). This relationship can be explained in the context of the social control theory (Nye, 1958), which states that sources of control such as the relationships, obligations, norms, values, and beliefs of individuals keep them from breaking the law. Parents can directly control their adolescent's behavior by monitoring them. But indirect control, such as the extent to which adolescents believe they are being monitored, also influences adolescents' behavior (Kopak et al., 2011). These forms of control try to get adolescents to follow their parents' rules. Parents can be seen as a source of control, making parental monitoring potentially a protective factor for the relationship between parental and adolescent alcohol use.

Review of Empirical Studies

Parental alcohol use and adolescent alcohol use

The positive relationship between maternal and paternal alcohol use and adolescent alcohol use has already been confirmed in several studies (Alati et al., 2014; Latendresse et al., 2008; Mahedy et al., 2018). The longitudinal study by Alati et al. (2014) divided adolescent alcohol use into five levels regarding frequency and intoxication over the last 30 days. Maternal and paternal alcohol use habits (non-drinker, ex drinker, occasional drinker, moderate drinker and heavy drinker) were reported by the mother. Parental alcohol use predicted a greater increase in alcohol use across adolescence. The longitudinal study by Mahedy and colleagues (2018) found a direct positive influence of parental alcohol use on adolescent alcohol use. Mothers reported their and their partner's alcohol use during the past week when their children were 12 years old. Parental alcohol use was divided into three categories: light, moderate and high-risk alcohol use. Adolescent alcohol use was measured at age 18 by questions regarding consumption of alcohol, possible dependence on alcohol and harmful alcohol use. The current study will differ from these studies by measuring parental

and adolescent alcohol use by the average glasses of alcohol per week. Measuring both adolescent and parental alcohol use in the same way may possibly better reflect the relationship.

Whether maternal alcohol use has a stronger or weaker effect on adolescent alcohol use than paternal alcohol use remains unclear. For example, Alati et al. (2014) concluded that maternal drinking was the strongest predictor for adolescent alcohol use, whereas Mares et al. (2011) concluded that paternal drinking was the strongest predictor. These contradictory findings demonstrate the importance of continuing to separately investigate the effect of maternal and paternal alcohol use on adolescent alcohol use, in order to use these new research insights in developing interventions.

The influence of parental monitoring

The influence of parental monitoring on the relationship between parental and adolescent alcohol use has, to my knowledge, not yet been researched. However, the protective effects of parental monitoring on adolescent alcohol use have been studied. Kopak and colleagues (2011) demonstrated that parental monitoring protected against adolescent alcohol use. The same applies to Carroll et al. (2016), they found that parental monitoring was related to less adolescent alcohol use. In both studies parental monitoring was measured, but no distinction between maternal and paternal monitoring was made. Thus, there is evidence for the protective effect of parental monitoring activities, but the differences between the protective effects of maternal and paternal monitoring are not that clear. In the current study, a distinction is made between paternal and maternal monitoring to test the separate effects.

The aforementioned study by Mahedy et al. (2018) also included parental monitoring in their research. Their mediation analysis showed weak evidence to suggest that parental monitoring accounted for some of the association between maternal and paternal alcohol use and adolescent alcohol use. However, an investigation of the moderating role of parental monitoring as proposed in the current study, has not yet been investigated before.

The Gap

There are two aspects in particular that make this study stand out. First, previous research that included parental monitoring often failed to distinguish between maternal and paternal monitoring. The current study does, and also distinguishes between paternal and maternal alcohol use. Second, the idea that paternal/maternal monitoring may be a protective factor for the relationship between paternal/maternal alcohol use and adolescent alcohol use has, to my knowledge, not yet been studied. Knowledge about this relationship and/or any

differences between maternal and paternal effects could be useful for intervention designs targeting parental involvement in adolescent alcohol use.

The Current Study

The current study uses longitudinal data from the Tracking Adolescents' Individual Lives Survey (TRAILS) to answer the following questions: *'What is the effect of maternal and paternal alcohol use on adolescent alcohol use, and which is a stronger predictor?'* and *'To what extent does parental monitoring influence the relationship between parental and adolescent alcohol use?'* This resulted in a conceptual model (fig. 1). Due to the modeling effect (Bandura, 1977), both maternal and paternal alcohol use are expected to be positively related to adolescent alcohol use. As the literature does not clarify whether paternal or maternal alcohol use is the strongest predictor for adolescent alcohol use, this will be explored. Furthermore, because monitoring possibly can be viewed as a protective factor (e.g. Kopak et al., 2011), maternal monitoring is expected to have an attenuating effect on the relationship between maternal and adolescent alcohol use, just as paternal monitoring is also expected to have an attenuating effect on the relationship between paternal and adolescent alcohol use.

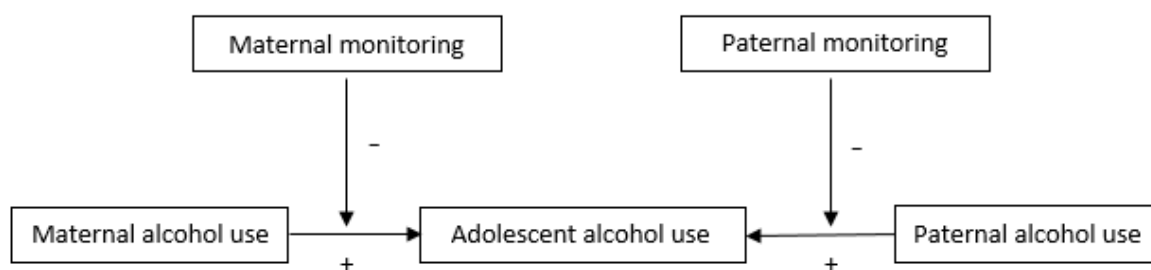


Figure 1: Visual representation of the attenuating effect of maternal monitoring on the positive relationship between maternal alcohol use and adolescent alcohol use and the attenuating effect of paternal monitoring on the positive relationship between paternal alcohol use and adolescent alcohol use.

Method

Procedure

The current study uses data from the Tracking Adolescents' Individual Lives Survey (TRAILS), which is a population-based prospective cohort study among Dutch adolescents. TRAILS is a multidisciplinary study with broadly oriented data with information on social, psychological and biological factors, collected from several informants: adolescents, parents, teachers, classmates, brothers and sisters through questionnaires, interviews, tests and/or physical measurements. The participants of the cohort were born between 1989 and 1991 and come from the North of the Netherlands, province of Groningen. At the start of TRAILS (2000), participants were ten to twelve years old ($M = 11.1$). The TRAILS-study is conducted every two to three years (Oldehinkel et al., 2015). The current study uses data from wave 3 (2005 to 2007) and 4 (2008 to 2010).

The original sample selection (T1) consisted of two stages. The first stage consisted of recruiting schools. A total of 135 schools (3483 children) received a letter with detailed information about the goals, design and practical procedures of TRAILS, after which 13 schools (9.6%) (338 children) refused to participate. The second stage consisted of recruiting children and their parents. Parents or guardians received an introduction letter with information brochures for themselves and their children about the goals, selection procedure, confidentiality and measures performed during the baseline measurement. About 1 week later, a TRAILS staff member visited the schools to inform children further and a trained interviewer contacted parents by telephone. Eventually, a total of 2230 participants were included in the study at baseline.

Sample

The current study uses data from wave 3 and 4 ($N=2229$). Participants were selected when they had participated in both waves and when their parents were heterosexual. A total of 814 participants remained who could be included in the analyses. Of these, 454 (55.8%) are female and 360 (44.2%) are male. At wave 4, the participants were between 17 and 20 years old, with a mean age of 18.47 ($SD=0.573$). Furthermore, 24 (2.9%) participants indicate that they follow or have obtained their highest diploma in low education level (VMBO-bb and VMBO-tl), 359 (47.1%) participants in medium education level (MBO and HAVO) and 431 (52.9%) participants in high education level (VWO, HBO and university) (Table 1).

Table 1*Descriptive statistics of adolescents (T4) (N=814)*

Variable	<i>N</i>	%	Range	<i>M</i>	<i>SD</i>
Gender					
Male	360	44.2			
Female	454	55.8			
Age			17-20	18.47	0.573
17	2	0.2			
18	455	55.9			
19	327	40.2			
20	30	3.7			
Educational level					
Low level	24	2.9			
Medium level	359	44.1			
High level	431	52.9			
Living situation					
With both biological parents	550	67.6			
Not with both biological parents	264	32.4			
Adolescent alcohol use			0-30	7.89	6.39
Maternal monitoring (T3)			0-4	2.48	0.89
Paternal monitoring (T3)			0-4	2.19	0.98

Measuring Instruments***Maternal and paternal alcohol use (T3)***

Maternal and paternal alcohol use were measured at wave 3. One parent reported alcohol use for themselves and their partner. They were asked about the number of weekend days (0 = "I never drink on weekend days" to 3 = "3 days") and weekdays (0 = "I never drink on weekdays" to 4 = "4 days") that they usually drink and how many glasses they drink on average per day (1 = "1 glass" to 10 = "20 or more glasses per day"). The same questions were asked about their partner. Two new variables were created: "maternal alcohol use" and "paternal alcohol use". These variables were created by multiplying the number of weekdays that alcohol is consumed by the number of drinks per weekday and adding the number of weekend days that people drink multiplied by the number of glasses per weekend day.

Maternal and paternal monitoring (T3)

Maternal and paternal monitoring at wave 3 were measured by asking the adolescent five questions about parental control related to their father and the same five questions related to their mother. An example question was: “Do you have to ask your mom first before you and your friends can decide what to do on Saturday night?” The response categories ranged from 0 = “never”, to 4 = “(almost) always”. Two separate factor analyses showed that the questions about the mother and the questions about the father measured one construct. The Cronbach’s alpha for the questions about maternal monitoring was .80 and for the questions about paternal monitoring it was .77. The variable “maternal monitoring” was created by calculating the average score on the five questions about the mother. To calculate the mean, at least three questions had to be answered. The same was done for the variable “paternal monitoring” with the questions about the father. A higher score means that there is a higher degree of monitoring.

Adolescent alcohol use (T3 and T4)

Adolescent alcohol use at wave 3 and 4 were measured with exactly the same four questions as for parental alcohol use at wave 3, but the response categories about quantity were slightly different. At wave 3 the response categories ranged from 0 = “I never drink on weekdays/weekend days” to 10 = “20 glasses or more”. At wave 4, the response categories ranged from 1 = “1 glass” to 10 = “20 glasses or more”. The variable “adolescent alcohol use” was created by multiplying the number of weekdays that alcohol is consumed by the number of drinks per weekday and adding the number of weekend days that parents drink multiplied by the number of glasses per weekend day.

Control variables

The following variables were controlled for: adolescent’s gender (T4), adolescent’s educational level (T4), adolescent’s living situation (T4) and adolescent’s alcohol use at wave 3. To determine the gender of the adolescent (T4), the adolescent had to indicate whether they identified themselves as a boy or a girl. For the adolescent’s age (T4), the age in whole years was asked. Educational level (T4) was measured with questions about the highest diploma obtained or about the current educational level if still at school. Educational level was categorized into: (1) low (VMBO-bb and VMBO-tl), medium (MBO and HAVO), and high (VWO, HBO and university). To determine the adolescent's living situation (T4), adolescents had to indicate who lived in the house with them. Many answer options were possible, such as mother, father, brothers, sisters, grandmother and friends. For the analysis, the respondents

were divided into two groups: adolescents who do not live with both biological parents and adolescents who do live with both biological parents. Lastly, there was also controlled for adolescent alcohol use (T3) to be able to make causal statements. This variable was created the same as adolescent alcohol use at wave 4.

Data Analysis

All statistical analyzes were performed using SPSS Statistics 28. First, the descriptive statistics of alcohol use of adolescents, alcohol use of parents and the degree of parental monitoring according to the adolescents were requested. In addition, bivariate correlations between all variables were calculated.

Subsequently, the assumptions for a multiple regression analyses were checked. These assumptions were linearity, normal distribution, homoscedasticity and no multicollinearity. Then, the multiple regression analysis could be performed to investigate whether there was a relationship between maternal and paternal alcohol use (independent variables (T3)) and adolescent alcohol use (dependent variable (T4)). In model 1, all control variables that, according to the correlation table, were found to be significantly associated with maternal (T3), paternal (T3) and adolescent alcohol use (T4) were added to the regression analysis, which aimed to predict adolescent alcohol use (T4). In order to test the relationship between parental and adolescent alcohol use, the variables maternal and paternal alcohol use (T3) were centered and added in model 2.

In model 3, the centered variables maternal and paternal monitoring (T3) were added, to test the relationship between parental monitoring and adolescent alcohol use. To test the moderating role of parental monitoring on the relationship between parental alcohol use and adolescent alcohol use, interaction terms were created by calculating the product of the centered variables maternal alcohol use and maternal monitoring and by calculating the product of the centered variables paternal alcohol use and paternal monitoring. These two interactions terms were also added in model 3. All relationships were considered significant if $p < .05$.

Assumptions

When checking for linearity, it turned out that the variables did not show a clear linear relationship. However, because the presence of no linear relationship was not clearly visible either, the assumption of linearity was accepted. Furthermore, the variables did not seem to be normally distributed. However, the used sample is relatively big ($N=814$) and according to Field (2017) normality is not a problem when using large samples. After requesting

scatterplots, it turned out that the assumption of homoscedasticity was not violated. The Variance Inflation Factor (VIF) was requested for the multicollinearity assumption. This turned out to be less than 10 (1.263) (Daoud, 2017), meaning that the assumption was not violated.

Results

Descriptive Statistics

The descriptive statistics of the adolescents ($N=814$) on T4 are reported in Table 1. The average number of glasses of alcohol consumed per week by adolescents ranged from 0 to 30. The adolescents reported drinking an average of 7.89 ($SD=6.39$) glasses of alcohol per week. Mothers and fathers of the adolescents also reported their alcohol use. The average number of glasses alcohol consumed per week by mothers ($N=814$) ranged from 0 to 28 with a mean score of 5.74 ($SD=6.21$) glasses on average per week. The average number of glasses alcohol consumed per week by fathers ($N=814$) ranged from 0 to 37, with a mean score of 9.92 ($SD=8.44$) glasses on average per week. On T3, adolescents reported the degree of monitoring of their parents. The score for maternal and paternal monitoring ranged from 0 to 4. The mean score for maternal monitoring was 2.48 ($SD=0.89$) and the mean score for paternal monitoring was 2.19 ($SD=0.98$).

Bivariate Correlation Analysis

The results of the bivariate correlation analysis are reported in Table 2. Pearson (r) was used for the numerical variables and Spearman (r_s) was used for the categorical variables (gender, educational level and living situation). There is a small significant positive correlation ($r = .19, p = <.001$) between maternal alcohol (T3) and adolescent alcohol use (T4). This means that when there was maternal alcohol use on T3, there was an increasing rate of adolescent alcohol use on T4. This also applies to the significant positive correlation ($r = .14, p = <.001$) between paternal alcohol use (T3) and adolescent alcohol use (T4). There is a small significant negative correlation ($r = -.11, p = .003$) between maternal monitoring (T3) and adolescent alcohol use (T4). When mothers monitored their child on T3, there was a decreasing rate of adolescent alcohol use on T4. This also applies to the small significant negative correlation ($r = -.11, p = .003$) between paternal monitoring (T3) and adolescent alcohol use (T4). Furthermore, there is a fairly large significant positive correlation ($r = .47, p = <.001$) between paternal and maternal alcohol use (T3). When paternal alcohol use increases, maternal alcohol use also increases. There was also a large significant positive correlation ($r = .81, p = .003$) between paternal and maternal monitoring. When paternal

monitoring increases, maternal monitoring also increases. Adolescent's living situation (T4) correlates small but significantly and negatively with adolescent alcohol use (T4) ($r_s = -.07, p = .046$), maternal alcohol use (T3) ($r_s = -.16, p = <.001$) and paternal alcohol use (T3) ($r_s = -.11, p = .002$). Adolescents who live with both biological parents consume less alcohol than adolescents who don't live with both their biological parents. Mothers/fathers also show less alcohol use when they are still together with the biological mother/father of their child. There are other significant correlations, but those are very small or irrelevant to the research questions of the current study.

Table 2*Bivariate correlation analysis*

	1	2	3	4	5	6	7	8	9	10
1. Adolescent alcohol use (T4)	-									
2. Maternal alcohol use (T3)	.19**	-								
3. Paternal alcohol use (T3)	.14**	.47**	-							
4. Maternal monitoring (T3)	-.11**	-.02	-.04	-						
5. Paternal monitoring (T3)	-.11**	-.01	-.07	.81**	-					
6. Adolescent's gender ^a (T4)	.26**	.02	.01	-.30**	-.25**	-				
7. Adolescent's age (T4)	.05	.10**	.05	-.05	-.04	.04	-			
8. Adolescent's educational level ^b (T4)	.05	.11**	.05	.16**	.15**	-.05	.05	-		
9. Adolescent's living situation ^c (T4)	-.07*	-.14**	-.10**	0.03	.08*	.10**	-.09**	-.09**	-	
10. Adolescent alcohol use (T3)	.41**	.18**	.12**	-.17**	-.19**	.12**	.14**	-.12**	-.08*	-

Note. * $p < .05$ ** $p < .01$

^a 0 = female 1 = male

^b 1 = low 2 = medium 3 = high

^c 0 = not with both biological parents, 1 = with both biological parents

Hierarchical Multiple Regression Analysis

The results of the hierarchical multiple regression, which aimed to predict adolescent alcohol use at T4, are reported in Table 3. In model 1 ($F(2, 811) = 84.74, p < .001, R^2 = .17$), the control variable 'adolescent's living situation' was added. Adolescent's living situation (T4) was not a significant predictor of adolescent alcohol use at T4 ($\beta = -.05, p = .120$). Adolescent alcohol use at T3 was also added in order to be able to make causal statements. Adolescent alcohol use (T3) was found to be a significant predictor of adolescent alcohol use at T4 ($\beta = .41, p = <.001$).

In model 2 ($F(2, 809) = 7.19, p < .001, \Delta R^2 = .01$), the two centered variables maternal and paternal alcohol use were added. While controlling for adolescent's living situation (T4) and adolescent alcohol use (T3), the multiple regression analysis revealed that maternal alcohol (T3) use emerged as a small, yet significant predictor ($\beta = .10, p = .008$) of adolescent

alcohol use at T4. Paternal alcohol use (T3) was found not to be a significant predictor ($\beta = .05, p = .200$) of adolescent alcohol use at T4.

In model 3 ($F(4, 805) = 0.37, p = .832, \Delta R^2 = .00$) the two centered variables maternal and paternal monitoring were added. While controlling for adolescent's living situation (T4), adolescent alcohol use (T3), maternal alcohol use (T3) and paternal alcohol use (T3), maternal ($\beta = -.04, p = .504$) and paternal ($\beta = .01, p = .932$) monitoring (T3) were found not to be significant predictors of adolescent alcohol use at T4. Maternal alcohol use (T3) was still found to be a significant predictor ($\beta = .10, p = .009$) of adolescent alcohol use at T4 when also controlling for maternal and paternal monitoring (T3). The two interaction terms were also added in model 3. While controlling for all other variables in the model, the interaction between maternal alcohol use and maternal monitoring ($\beta = -.02, p = .631$) and the interaction between paternal alcohol use and paternal monitoring ($\beta = -.01, p = .816$) were found not to be significant. Parental monitoring did not influence the relationship between parental and adolescent alcohol use.

Table 3

Hierarchical multiple regression aiming to predict adolescent alcohol use on T4 (N=814)

	β	SEb	b	95% CI
Model 1: control variables				
Adolescent's living situation ^a (T4)	-.05	.44	-.68	-.1.54, .18
Adolescent alcohol use (T3)	.41*	.04	.50	.43, .58
Model 2: + parental alcohol use				
Adolescent's living situation ^a (T4)	-.03	.44	-.42	-1.28, .44
Adolescent alcohol use (T3)	.39*	.04	.48	.40, .56
Maternal alcohol use (T3)	.10*	.04	.10	.03, .17
Paternal alcohol use (T3)	.05	.03	.04	-.02, .09
Model 3: + parental monitoring & interactions				
Adolescent's living situation ^a (T4)	-.03	.44	-.41	-1.27, .46
Adolescent alcohol use (T3)	.38*	.04	.47	.39, .55
Maternal alcohol use (T3)	.10*	.04	.10	.03, .17
Paternal alcohol use (T3)	.04	.03	.03	-.02, .09
Maternal monitoring (T3)	-.04	.39	-.27	-1.02, .49
Paternal monitoring (T3)	.01	.35	.03	-.66, .72
Maternal alcohol use * Maternal monitoring	-.02	.04	-.02	-.10, .06
Paternal alcohol use * Paternal monitoring	-.01	.03	-.01	-.06, .04

Note. * $p < .05$

^a0 = not with both biological parents, 1 = with both biological parents

Discussion

The aim of this study was to investigate to what extent parental monitoring influenced the relationship between parental alcohol use and adolescent alcohol use and to examine differences between maternal and paternal effects. Maternal and paternal alcohol use were expected to predict adolescent alcohol use at a later time. This was mainly based on the social learning theory (Bandura, 1977), which states that adolescents tend to imitate their parents' drinking behavior. As the literature did not clarify whether paternal or maternal alcohol use is the strongest predictor for adolescent alcohol use, this was explored. Furthermore, it was expected that maternal monitoring had an attenuating effect on the relationship between maternal and adolescent alcohol use, just as paternal monitoring was expected to have an attenuating effect on the relationship between paternal and adolescent alcohol use. This was based on the protective effects that parental monitoring has on adolescent alcohol use (e.g. Kopak et al., 2011). A significant positive relationship was found between maternal and adolescent alcohol use, but no significant relationship was found between paternal and adolescent alcohol use. Therefore, maternal alcohol use was found to be the strongest predictor for adolescent alcohol use. Maternal/paternal monitoring did not influence the relationship between maternal/paternal and adolescent alcohol use.

The first research question in this study was: *'What is the effect of maternal and paternal alcohol use on adolescent alcohol use, and which is a stronger predictor?'* In this longitudinal study, maternal alcohol use was found to predict adolescent alcohol use at a later time. In concordance with findings of the longitudinal study of Alati et al. (2014) maternal alcohol use was therefore found to be the strongest predictor for adolescent alcohol use. The finding that paternal alcohol use did not predict adolescent alcohol use at a later time contradicts previous studies (e.g. Mares et al., 2011). It is possible that paternal alcohol use was not always entered truthfully in the questionnaire. Since most parents who filled in the questionnaire were mothers, these mothers also filled in their partner's alcohol use. Mothers probably based the number of drinks and days of the week their partner drinks on what they saw or on what their partner told them. The answers of the mother may thus be an underestimation of the actual number of drinks and days the father of the adolescent drinks, which could have influenced the results. Alati et al. (2014) also indicate that filling in an answer for a partner can be difficult. However, according to the current study, it is maternal alcohol use that has the most influence on adolescent alcohol use. Therefore, it is important to design interventions in which specifically mothers become aware of the impact they have with their alcohol use on their adolescent's alcohol use. In 2020, a campaign was launched in the

Netherlands to raise awareness among parents about the influence of parental alcohol use on children's alcohol behaviour. This campaign was called 'Seeing drinking, does drinking' (Alliance Alcohol policy Netherlands, n.d.). If future empirical studies also confirm that maternal alcohol use is the strongest predictor for adolescent alcohol use, such campaigns should focus more on mothers. It would also be useful for future research to examine differences between the influence of parental alcohol use on female and male adolescents. Possible gender differences could also be included in interventions regarding parental influence on adolescent alcohol use.

The second research question in this study was: *'To what extent does parental monitoring influence the relationship between parental and adolescent alcohol use?'* This was the first research, to my knowledge, that investigated the influence of parental monitoring on the relationship between parental and adolescent alcohol use. No evidence was found for this influence. When mothers/fathers monitored their adolescents, it did not affect the relationship between theirs and their adolescent's alcohol use. Because this study did show that maternal alcohol predicted adolescent alcohol use at a later time, it is important to further investigate which factors can weaken this relationship. Parental alcohol-specific communication appears to be a factor that can reduce alcohol use among adolescents (Reimuller et al., 2011). Reimuller et al. (2011) even suggest that parental alcohol-specific communication has a greater influence on adolescent alcohol use than parental alcohol use has. If, for example, parental alcohol-specific communication appears to be a factor that can weaken the relationship between parental and adolescent alcohol use, that would be useful knowledge for designing interventions targeting parental involvement in adolescent alcohol use.

Another noteworthy finding of this study is that no evidence was found for the protective effects of parental monitoring on adolescent alcohol use. Other studies did find that parental monitoring reduced adolescent alcohol use (Kopak et al., 2011; Villarreal & Nelson, 2018). The finding from the current study was therefore unexpected. However, the aforementioned studies constructed their parental monitoring variable with items about parental knowledge, while the current study constructed parental monitoring with items about parental control. Using a different kind of items to construct parental monitoring could explain the different results. In the current study, a construct other than parental monitoring could have been measured by mistake. More research is needed into the best way to construct parental monitoring. Also further empirical research into the separate effects of maternal and

paternal monitoring is important, because previous research often failed to distinguish between maternal and paternal monitoring (e.g. Carroll et al., 2016).

Strengths and Limitations

There are a number of strengths to mention about this study. To the best of my knowledge this is the first study that investigated the influence of parental monitoring on the relationship between parental and adolescent alcohol use. This study included a large sample and was performed using a longitudinal design, which makes determining variable patterns over time more effective. An additional strength of this study was that a distinction was made between maternal and paternal effects, namely between maternal and paternal monitoring and between maternal and paternal alcohol use. Previous research often failed to distinguish between maternal and paternal monitoring (e.g. Kopak et al., 2011).

Beside the strengths, there are also some limitations to keep in mind. Firstly, the variables that have been used were based on self-report. It is possible that the participants did not answer the questions truthfully. To counteract these risks, anonymity was emphasized before the adolescents and parents completed the questionnaires (Brenner et al., 2003). Secondly, it is important to note that the alcohol use variables do not perfectly equate the number of glasses per week. The value of the scale does not reflect the number of glasses for the higher values. For example, if the adolescent or parent responded with “7-10 glasses” (value 7), it is unclear how many glasses they drink exactly. Thirdly, the data used in this study come from one of the first waves of the TRAILS-study: wave 3 (2005 to 2007) and wave 4 (2008 to 2010). It is possible that these data are no longer consistent with parents’ current awareness of their influence on their adolescents’ alcohol use. For example, the implementation of the Icelandic prevention model in Dutch municipalities in recent years strongly focuses on creating more awareness among parents about the influence they can have on their adolescent's alcohol use (Staal, 2022).

Conclusion

From the current study can be concluded that maternal alcohol use is the strongest predictor for adolescent alcohol use. It is therefore important that specifically mothers of adolescents become aware of the influence they have on their adolescent's alcohol use. Parental monitoring was unable to attenuate the relationship between parental and adolescent alcohol use. Based on the results of the current study, parental monitoring appears not to be a factor that can be included in interventions targeting to reduce the influence of parental alcohol use on adolescent alcohol use. It is important to further investigate which parental

factors could play this role. If factors are found, such as parental alcohol-specific communication, that can attenuate the relationship between parental and adolescent alcohol use, this would be very useful for designing interventions targeting parental involvement in adolescent alcohol use. Especially factors that can weaken the relationship between maternal and adolescent alcohol use are important to investigate as, according to the current study, maternal alcohol use appeared to be the strongest predictor for adolescent alcohol use.

References

- Alati, R., Baker, P., Betts, K. S., Connor, J. P., Little, K., Sanson, A., & Olsson, C. A. (2014). The role of parental alcohol use, parental discipline and antisocial behaviour on adolescent drinking trajectories. *Drug and alcohol dependence*, 134, 178-184. <https://doi.org/10.1016/j.drugalcdep.2013.09.030>
- Alliance Alcohol policy Netherlands. (n.d). Zien drinken, doet drinken. Alliance Alcohol policy Netherlands. https://ziendrinkendoetdrinken.nl/alliantie_alcoholbeleid_nederland/
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs: Prentice-Hall.
- Bo, A., Hai, A. H., & Jaccard, J. (2018). Parent-based interventions on adolescent alcohol use outcomes: A systematic review and meta-analysis. *Drug and alcohol dependence*, 191, 98-109. <https://doi.org/10.1016/j.drugalcdep.2018.05.031>
- Bray, J. H., Gallegos, M. I., Cain, M. K., & Zaring-Hinkle, B. (2022). Parental monitoring, family conflict, and adolescent alcohol use: A longitudinal latent class analysis. *Journal of Family Psychology*, 36(7), 1154–1160. <https://doi.org/10.1037/fam0001019>
- Brener, N. D., Billy, J. O. G., & Grady, W. R. (2003). Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: evidence from the scientific literature. *Journal of Adolescent Health*, 33, 436–457. [https://doi.org/10.1016/S1054-139X\(03\)00052-1](https://doi.org/10.1016/S1054-139X(03)00052-1)
- Brody, G. H., Ge, X., Katz, J., & Arias, I. (2000). A longitudinal analysis of internalization of parental alcohol-use norms and adolescent alcohol use. *Applied developmental science*, 4(2), 71-79. https://doi.org/10.1207/S1532480XADS0402_2
- Carroll, H. A., Heleniak, C., Witkiewitz, K., Lewis, M., Eakins, D., Staples, J., Andersson, C., Berglund, M., & Larimer, M. E. (2016). Effects of parental monitoring on alcohol use in the US and Sweden: A brief report. *Addictive Behaviors*, 63(1), 89–92. <https://doi.org/10.1016/j.addbeh.2016.07.014>
- Daoud, J. I. (2017). Multicollinearity and regression analysis. *Journal of Physics: Conference Series*, 949, <https://doi.org/10.1088/1742-6596/949/1/012009>
- Field, A. P. (2017). Discovering statistics using IBM SPSS statistics, 5th edition. In *SAGE Publications eBooks*. <http://sro.sussex.ac.uk/id/eprint/77862/>
- GGD GHOR Nederland. (2020). *Gerichter beleid nodig op roken en alcoholgebruik Nederlandse scholieren*. GGD GHOR Nederland. <https://ggdghor.nl/actueel-bericht/gericht-beleid-nodig-op-roken-en-alcoholgebruik-nederlandse-scholieren>

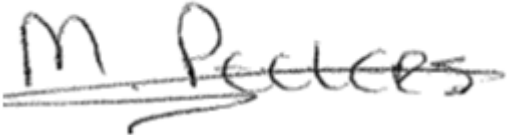
- Jellinek. (2021). *Zijn Nederlandse jongeren de zuipschuiten van Europa?*
<https://www.jellinek.nl/vraag-antwoord/zijn-nederlandse-jongeren-de-zuipschuiten-van-europa/>
- Kamps, L. (2022). *Waarom is het voor jongeren extra gevaarlijk om alcohol te drinken?*
 ALCOHOLInfo.nl. <https://www.alcoholinfo.nl/effecten/risicos-voor-jongeren>
- Kopak, A. M., Ayers, S., Lopez, V., & Stevenson, P. (2011). Parental monitoring, alcohol, and marijuana use among Hispanic and non-Hispanic White adolescents: Findings from the Arizona Youth Survey. *Journal of Drug Issues, 41*(4), 461–486.
<https://doi.org/10.1177/002204261104100402>
- Kuntsche, S., & Kuntsche, E. (2016). Parent-based interventions for preventing or reducing adolescent substance use - A systematic literature review. *Clinical psychology review, 45*(1), 89-101. <https://doi.org/10.1016/j.cpr.2016.02.004>
- Latendresse, S. J., Rose, R. J., Viken, R. J., Pulkkinen, L., Kaprio, J., & Dick, D. M. (2008). Parenting mechanisms in links between parents' and adolescents' alcohol use behaviors. *Alcoholism: Clinical and Experimental Research, 32*(2), 322-330.
<https://doi.org/10.1111/j.1530-0277.2007.00583.x>
- Lionetti, F., Palladino, B. E., Moses Passini, C., Casonato, M., Hamzallari, O., Ranta, M., ... & Keijsers, L. (2019). The development of parental monitoring during adolescence: A meta-analysis. *European Journal of Developmental Psychology, 16*(5), 552-580.
<https://doi.org/10.1080/17405629.2018.1476233>
- Lynch, A. D., Coley, R. L., Sims, J., Lombardi, C. M., & Mahalik, J. R. (2015). Direct and interactive effects of parent, friend and schoolmate drinking on alcohol use trajectories. *Psychology & Health, 30*(10), 1183-1205.
<https://doi.org/10.1080/08870446.2015.1040017>
- Mahedy, L., MacArthur, G. J., Hammerton, G., Edwards, A. C., Kendler, K. S., Macleod, J., ... & Heron, J. (2018). The effect of parental drinking on alcohol use in young adults: the mediating role of parental monitoring and peer deviance. *Addiction, 113*(11), 2041-2050. <https://doi.org/10.1111/add.14280>
- Mares, S. H., van der Vorst, H., Engels, R. C., & Lichtwarck-Aschoff, A. (2011). Parental alcohol use, alcohol-related problems, and alcohol-specific attitudes, alcohol-specific communication, and adolescent excessive alcohol use and alcohol-related problems: An indirect path model. *Addictive behaviors, 36*(3), 209-216.
<https://doi.org/10.1016/j.addbeh.2010.10.013>

- Nye, F. I. (1958). *Family relationships and delinquent behavior*. New York: John Wiley & Sons.
- Oldehinkel, A. J., Rosmalen, J. G., Buitelaar, J. K., Hoek, H. W., Ormel, J., & Raven, D. & Hartman, CA (2015). Cohort profile update: The TRacking Adolescents' individual lives survey (TRAILS). *International journal of epidemiology*, 44(1).
<https://doi.org.proxy.library.uu.nl/10.1093/ije/dyu225>
- Reimuller, A., Hussong, A., & Ennett, S. T. (2011). The influence of alcohol-specific communication on adolescent alcohol use and alcohol-related consequences. *Prevention Science*, 12, 389-400. <https://doi.org/0.1007/s11121-011-0227-4>
- Rombouts, M., Van Dorsselaer, S., Scheffers - van Schayck, T., Tuithof, M., Kleinjan, M., & Monshouwer, K. (2020). *Jeugd en riskant gedrag 2019*. Trimbos Institute.
<https://open.overheid.nl/repository/ronl-18b8fed8-91f4-4bb0-8c8f-e9e2110aab1e/1/pdf/VGP-206966%20B.pdf>
- Staal, J. (2022). *Aan de slag met het IJslandse preventiemodel*. Trimbos Institute.
<https://www.trimbos.nl/kennis/aan-de-slag-met-het-ijslandse-preventiemodel>
- Vermeulen-Smit, E., Koning, I. M., Verdurmen, J. E., Van der Vorst, H., Engels, R. C., & Vollebergh, W. A. (2012). The influence of paternal and maternal drinking patterns within two-partner families on the initiation and development of adolescent drinking. *Addictive behaviors*, 37(11), 1248-1256.
<https://doi.org/10.1016/j.addbeh.2012.06.005>
- Villarreal, D. L., & Nelson, J. A. (2018). Parental monitoring and adolescent risk behaviors: the moderating role of adolescent internalizing symptoms and gender. *Journal of Child and Family Studies*, 27(11), 3627-3637. <https://doi.org/10.1007/s10826-018-1203-4>

Appendix 1 – Registration Form: Research Activities for TED-students

Name: Sam van Buul

Student number: 6909701

Research Activities	Total number of Hours	Signature YS staff
Updating website information for Trimbo's Institute with new meta reviews/empirical findings around youth and alcohol use.	60 hours	Margot Peeters, 

Total	60 hours	
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