Relevant Individual, Peer, and Parent Factors for the Prevention of Adolescents' Binge Drinking

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Abstract (English)

As prevalence rates for Dutch adolescents' binge drinking (BD) remain alarmingly high, the need for effective intervention strategies is rising. Therefore, it is important to identify risk factors from various domains that contribute to adolescents' BD. The current study investigated which factors in the individual (enhancement and coping motives), peer (descriptive and injunctive norms), and parent (alcohol-specific rules and parental monitoring) domain contributed to the BD prevalence among adolescents in a Dutch municipality, as well as the moderating role of gender and frequency of alcohol use. Dutch adolescents ($N = 1006$) aged 11 to 17 completed an online self-report questionnaire on drinking motives, social norms, (alcohol-specific) parenting practices, alcohol use, and BD. Logistic regression analyses per domain showed that stronger enhancement motives, and positive descriptive and injunctive norms increased the likelihood to engage in BD, while strict alcohol-specific rules decreased the likelihood to engage in BD. Together, only stronger enhancement motives (individual) and more positive injunctive norms (peers) remained significant. These findings have implications for the development of multi-level interventions that are pressed to be needed for complex problems as adolescents' BD.

Keywords: binge drinking, drinking motives, social norms, parenting practices, prevention

Abstract (Nederlands)

Doordat de prevalentie van binge-drinken (BD) onder Nederlandse adolescenten alarmerend hoog blijft, neemt de behoefte aan effectieve interventiestrategieën toe. Hiervoor is het van belang om risicofactoren uit verschillende domeinen te identificeren die bijdragen aan BD bij adolescenten. In de huidige studie is onderzocht welke factoren in het individuele (enhancement en coping motieven), peer (beschrijvende en injunctieve normen) en ouder (alcohol-specifieke regels en ouderlijk toezicht) domein bijdragen aan de BD prevalentie bij adolescenten in een Nederlandse gemeente, evenals de modererende rol van geslacht en frequentie van alcoholgebruik. Nederlandse adolescenten (N = 1006) in de leeftijd van 11 tot en met 17 jaar vulden een online zelfrapportagevragenlijst in over drinkmotieven, sociale normen, (alcohol-specifieke) opvoedingspraktijken, alcoholgebruik en BD. Logistische regressieanalyses per domein toonden aan dat sterkere enhancement motieven en positieve descriptieve en injunctieve normen de kans op BD vergrootten, terwijl strenge alcohol-specifieke regels de kans op BD verkleinden. Bij het samenvoegen van deze factoren bleven alleen sterkere enhancement motieven (individueel) en positievere injunctieve normen (peers) significant. Deze bevindingen hebben implicaties voor de ontwikkeling van multi-level interventies die dringend nodig zijn voor complexe problemen als BD onder adolescenten.

Trefwoorden: binge drinken, drinkmotieven, sociale normen, opvoedingspraktijken, preventie

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Despite declines in Dutch adolescents' alcohol use, adolescents' binge drinking (BD) remains alarmingly high: of the Dutch adolescents aged 12-16 who have drunk alcohol, 71% engaged in BD in the past month (Stevens et al., 2018). BD is often defined as consuming five or more alcoholic drinks on one occasion (Fillmore & Jude, 2011; Labhart et al., 2018). In adolescence, BD relates to increased morbidity and mortality, neuropsychological deficits, mental health problems, and future alcohol addiction (Adan et al., 2016; Miller et al., 2007; Theunissen et al., 2011). This contributes to high costs for society (Sacks et al., 2013). To effectively prevent adolescents' BD, its risk factors should be determined. Ecological models (Bronfenbrenner, 1979; Mcleroy et al., 1988) suggest that factors in multiple domains combine to affect adolescents' BD. Therefore, the current study aims to investigate the relationship between risk factors in three domains (individual, peers, and parents) and BD among adolescents, focusing on factors relevant for prevention purposes.

Individual Domain: Drinking Motives

In the individual domain, research has highlighted the role of drinking motives as the most proximal and important factor related to alcohol use (Kuntsche et al., 2005). The motivational model (Cox & Klinger, 1988) proposes four drinking motives, based on the propositions that individuals drink to obtain positive or avoid negative outcomes and are motivated to drink by internal or external rewards: enhancement (enhance a positive mood); coping (cope with/reduce negative emotions); social (obtain social rewards); conformity (avoid social rejection; Cooper, 1994). Research showed that especially enhancement and coping motives are positively related to adolescents' BD (Bergagna & Tartaglia, 2019; Kuntsche et al., 2005; Laghi et al., 2016, 2019; Lannoy et al., 2019; Pompili & Laghi, 2019; Sjödin et al., 2021), while social and conformity motives are respectively correlated with moderate drinking and lower drinking levels (Bergagna & Tartaglia, 2019; Kuntsche et al., 2005; Sjödin et al., 2021). Thus, it seems that adolescents who drink for internal rewards are more likely to engage in BD than adolescents who drink for external rewards.

Peer and Parent Domain: Social Norms, Parental Rules, and Parental Monitoring

Besides drinking motives, research and theory also emphasize the importance of peers and parents for adolescents' BD. For example, the perceived frequency and quantity of peers' drinking (descriptive norms) and the perceived (dis)approval of peers about drinking (injunctive norms) have shown among the strongest predictors of adolescents' BD in the peer

domain (Cialdini et al., 1990; Rimal & Real, 2003). Descriptive (Bergagna & Tartaglia, 2019; Brooks-Russell et al., 2014; Pilatti et al., 2021; Voogt et al., 2013) and injunctive (Edwards et al., 2021; Pedersen et al., 2017; Voogt et al., 2013) peer norms favorable of (binge) drinking are generally positively linked to adolescents' BD. That is, adolescents tend to overestimate how much their peers drink and approve of drinking, and they use these misperceptions to match their behavior with that of their peers (McAlaney et al., 2015; Vallentin-Holbech et al., 2017). This increases the likelihood to engage in BD (Voogt et al., 2013).

Regarding parental factors, parental monitoring and alcohol-specific rules have shown among the most profound effects (Harakeh et al., 2012; Yap et al., 2017). Parental monitoring -defined as the extent to which parents know what their child does and with whom- might decrease adolescents' BD (Jang et al., 2013; Yap et al., 2017). Similarly, low levels of parental monitoring contributed to an increase in adolescents' BD in previous research (Donaldson et al., 2016; Rusby et al., 2018). The same seems to apply to alcohol-specific rules: permissive alcohol-specific rules are associated with increased engagement in adolescents' BD (Harakeh et al., 2012; Janssen et al., 2014) while strict alcohol-specific rules are linked to lower rates of adolescent BD (Cox et al., 2018; Mares et al., 2012; Østergaard et al., 2018; Schwinn & Schinke, 2014). Taken together, it seems that in the parent domain, parental monitoring and alcohol-specific rules could be either risk or protective factors for adolescents' BD, depending on the level of monitoring and strictness of rules.

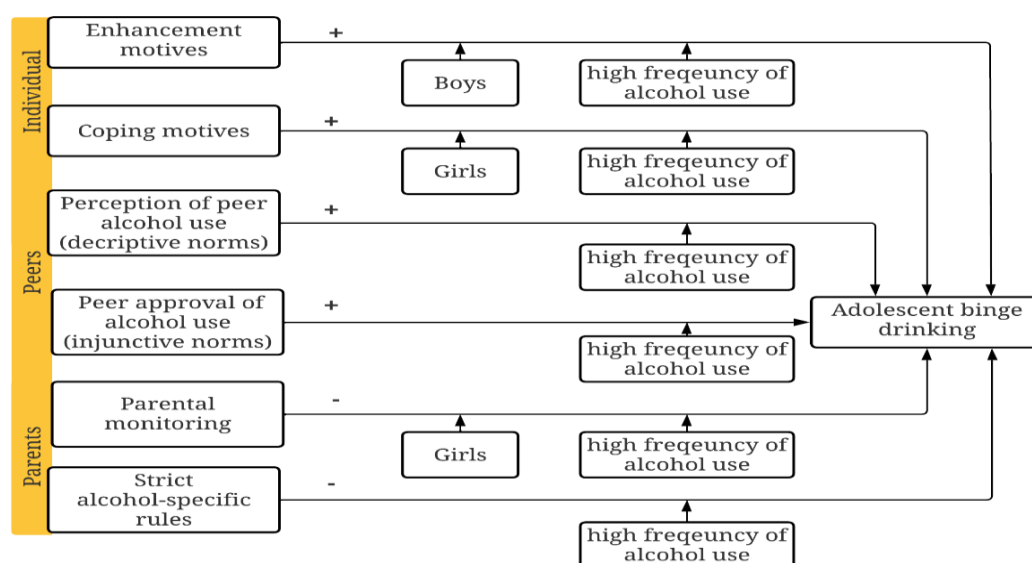**The Role of Gender and Frequency of Alcohol Use**

The relation between individual, peer, and parent factors on BD may be different for boys and girls; in line with the differential susceptibility hypothesis (Belsky, 1997). For drinking motives, Lammers et al. (2013) showed stronger relations between enhancement motives and BD for boys, while for girls, stronger correlations were found for coping motives. Gender differences for descriptive and injunctive peer norms have also been found but their direction is not as clear: a review study showed that some studies found stronger links between social norms and BD for girls, while others indicated stronger links for boys (Dir et al., 2017). Furthermore, parental monitoring seems more protective for girls' (binge) drinking (Doumas et al., 2015; Rusby et al., 2018), suggesting stronger correlations between parental monitoring and BD for girls. Lastly, gender differences in the relation between alcohol-specific rules and adolescents' BD have not yet been established. Nevertheless, including gender as a moderator may increase the robustness of this relation (Mares et al., 2012). Therefore, in addition to testing correlations between various predictors and BD, it might also be useful to investigate gender differences in these links.

Another factor that might affect the relationship between the predictor-BD links is the frequency of alcohol use. Recent findings suggest that fewer adolescents have ever drunk alcohol, but the adolescents that do consume alcohol are more likely to drink a lot (e.g., BD; Stevens et al., 2018). This reflects a so-called polarization effect, in which the majority of the adolescent population reduces their alcohol consumption while a subgroup of adolescents (heavily) increases their alcohol consumption (Hallgren et al., 2012). While the reasons for this effect are not clear, it is suggested that adolescents in the subgroup form an at-risk group that experiences an accumulation of risk factors (Hallgren et al., 2012), such as peer drinking (Chassin et al., 2002) or a lack of parental monitoring (Ewing et al., 2015). This way, the effects of such risk factors could be stronger for adolescents in the subgroup (who have a higher frequency of alcohol use) than for adolescents in the majority group (who have a lower frequency of alcohol use).

The Current Study

While previous research on predictors of adolescents' BD has been useful, there remain gaps in the literature. For instance, in the Dutch municipality Nieuwegein prevalence rates of BD among adolescents who have drunk alcohol have been around 68% since 2007 (GGD Regio Utrecht, n.d.), despite interventions trying to reduce BD among adolescents in this municipality. Furthermore, it is for intervention purposes particularly important to investigate which proximal factors across domains (combine to) affect adolescents' BD. However, most previous studies have not taken this into account. Therefore, this study investigates which factors in the individual, peers, and parents domain contribute to the BD prevalence among adolescents in Nieuwegein, as well as the moderating role of gender and frequency of alcohol use.

Based on theory and literature, it is hypothesized that stronger enhancement motives and coping motives, as well as positive descriptive norms and injunctive norms, increase the likelihood to engage in BD, while strict alcohol-specific rules and parental monitoring decrease the likelihood to engage in BD (see Figure 1). Gender and frequency of alcohol use are expected to moderate these predictor-BD links. Stronger relations between enhancement motives and BD are assumed for boys, while for girls, stronger associations of coping motives and parental monitoring on BD are expected. For descriptive norms, injunctive norms, and alcohol-specific rules, however, the direction of the gender differences is not clear. For frequency of alcohol use, a stronger relationship between all predictors and BD is expected for adolescents who have a high frequency of alcohol use.

Figure 1

Hypothetical Model of Factors Contributing to Adolescents' Binge Drinking

Methods

Procedure

The current study used existing data from a project in the municipality of Nieuwegein that investigates the well-being and substance use of high school students. Data for the project were collected in November/December 2021. To recruit participants, all three high schools in Nieuwegein were approached via the municipality of Nieuwegein (convenience sample). Two of these were willing to participate. In other years, a national monitoring study was already conducted at these schools, and the schools did not want to over ask the students. Therefore, only pupils of grades 1, 3, 5, and 6 of all educational levels offered at the schools were given the opportunity to participate. Before participating, parents received an information letter about the project and could refuse participation of their child (passive informed consent). The questionnaire was then administered to adolescents on a computer/laptop during class. It took a maximum of 45 minutes to complete. All data were collected and processed anonymously. The project in the municipality of Nieuwegein was approved by the Ethics Review Board of the Faculty of Behavioral & Social Sciences at Utrecht University (FETC18-060).

Sample

In total, 1300 adolescents participated in the project. In the present study, only underaged participants (<18 years) were included ($N = 1180$). Participants were excluded if they were missing demographic variables ($N = 1$), did not fill out the complete questionnaire

(sufficiently) ($N = 165$), or always indicated the minimum score ($N=8$). This resulted in a sample of 1006 participants eligible for analysis, including 50.60% boys and a mean age of 13.87 years old ($SD = 1.90$). Participants were in vocational (VMBO/HAVO; 9.15%) and higher (HAVO/VWO; 90.85%) educational levels. Notably, only 216 participants filled out questions regarding drinking motives, hence, analyses for drinking motives are based on a sample of 216 participants instead of 1006.

Measurements

Binge Drinking

Binge drinking entails consuming five or more alcoholic drinks on one occasion. Adolescents were asked how often they had done this in the past four weeks. Answer categories (ranging from *0* to *40 or more*) were recoded into 0 (*never*) and 1 (*at least once*).

Individual Domain

Enhancement and *coping motives* respectively indicate drinking alcohol to enhance a positive mood or reduce negative emotions. Both constructs were measured with a subscale consisting of three items from the Drinking Motive Questionnaire Revised Short Form (Kuntsche & Kuntsche, 2009), measuring either enhancement (e.g., "because then I feel happy") or coping (e.g., "to forget my problems") motives. Response categories ranged from 1 (*never*) to 5 (*always*). Mean scores were calculated for both scales. Higher scores reflect stronger enhancement or coping motives. Cronbach's alphas were .77 (enhancement) and .91 (coping).

Peer Domain

Descriptive norms -the perceived frequency and quantity of peers' drinking- was measured using two items (e.g., "How many of your peers do you think get drunk?"; Elek et al., 2006). Response categories ranged from 1 (*no one*) to 5 (*everyone*). A mean score was calculated. Higher scores indicate more positive descriptive norms. The Pearson correlation for this scale was $r = .86$, $p = < .00$.

Injunctive norms reflect the perceived (dis)approval of peers about drinking. It was measured using four items, with response categories ranging from 1 (*strong disapproval*) to 7 (*strong approval*) (Baer, 1994). One item (i.e., "indicate whether you think your friends would (dis)approve if you decide not to drink alcohol") was reversed. A mean score was calculated. A higher score indicates more positive injunctive norms. Cronbach's alpha for this scale was .45, however, removing the reversed item increased it to .83. Therefore, a new mean score was calculated using the three remaining items.

Parent Domain

Parental monitoring refers to the extent to which parents know about their children's whereabouts. It was measured using five items (e.g., "Do you need your parents' permission to go out for an evening on a weekday?"; Kerr et al., 2012). Response categories ranged from 1 (*never*) to 5 (*always*). A mean score was calculated. A higher score indicates more parental monitoring. Cronbach's alpha for this scale was .85.

Alcohol-specific rules – parents' rules on their child's drinking – was measured using five items (e.g., "indicate to what extent you can drink alcohol on the weekend"; de Looze et al., 2012; van der Vorst et al., 2007). Response categories ranged from 1 (*certainly not*) to 5 (*certainly*). All items were reversed before calculating a mean score so that a higher score reflects stricter alcohol-specific rules. Cronbach's alpha for this scale was .95.

Alcohol Use

Frequency of alcohol use entails how often adolescents have drunk alcohol. It was measured by asking how often an adolescent had drunk at least one glass of alcohol in his/her life. Answer categories ranged from 1 (*0*) to 14 (*40 or more*).

Demographic Variables

Participants were asked about their *age* (in years), *gender* (0=boys, 1=girls), and *educational level* (0=VMBO/HAVO, 1=HAVO/VWO). Age and educational level were included as control variables (de Looze et al., 2017; Harakeh et al., 2012).

Data-analysis

The results were analyzed using SPSS Statistics 28. First, descriptives, frequencies, and Spearman correlations were obtained for all variables. Independent samples t-tests were performed to examine gender differences in key variables. Second, logistic regression analyses were performed per domain (individual, peers, and parents) to examine which factors contribute to the BD prevalence in adolescents. In step 1, a bivariate analysis was performed with the control variables. In step 2, predictors of one domain were added to the model. In step 3, gender and the interaction term 'predictorXgender' were added to the model to test the moderating effect of gender. In step 4, frequency of alcohol use and the interaction term 'predictorXfrequency of alcohol use' were added to the model to test the moderating role of frequency of alcohol use. After these steps, all significant factors were analyzed in one logistic regression model to gain insight into the main factors contributing to the BD prevalence among adolescents.

Results

Alcohol Use and Binge Drinking in Adolescents

Descriptive analyses (see Table 1) showed that 385 adolescents (38.27%) had drunk alcohol at least once in their life. Out of these, 140 adolescents (36.36%) had engaged in BD in the past four weeks. Significant gender differences were found for descriptive norms and parental monitoring, where girls reported more positive descriptive norms ($t = -2.90$, $p = .00$) and more parental monitoring ($t = -4.56$, $p = .00$) compared to boys. No significant gender differences were found for frequency of alcohol use, enhancement motives, coping motives, injunctive norms, alcohol-specific rules, and BD.

Table 1

Descriptive Statistics of Key Variables.

Variable	Total ($N = 1006$)		Boys ($N = 509$)		Girls ($N = 497$)	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
Frequency alcohol use	3.52	4.32	3.52	4.34	3.53	4.30
Enhancement motives[a]	2.49	1.07	2.50	1.12	2.48	1.04
Coping motives[a]	1.69	1.01	1.63	1.01	1.75	1.01
Descriptive norms	2.10	1.11	2.00	1.05	2.20**	1.16
Injunctive norms	1.86	1.40	1.92	1.52	1.79	1.26
Parental monitoring	3.96	0.94	3.83	0.98	4.09**	0.87
Alcohol-specific rules	4.24	1.14	4.28	1.11	4.19	1.18
Binge drinking (% at least once)	13.92	-	13.36	-	14.49	-

Note. SD = standard deviation

Asterisks indicate whether boys significantly differ from girls with ***p<.01 *p<.05*

[a] $N_{total\ sample} = 216$ $N_{boys\ sample} = 106$ $N_{girls\ sample} = 110$

Table 2 shows the Spearman correlations between all study variables. Overall, the correlations between all predictors and BD were significant. A higher BD prevalence was related to a higher frequency of alcohol use, stronger enhancement and coping motives, positive descriptive and injunctive norms, less parental monitoring, and permissive alcohol-specific rules. Similar findings were found for the correlations with frequency of alcohol use.

Individual Domain: Enhancement and Coping Motives

In the individual domain, a logistic model was used to test the relationship between enhancement and coping motives on the BD prevalence among adolescents (see Table 3). In step 1 (Table 3, model 1), it was found that enhancement motives were significantly related to BD ($OR = 2.51$, $p < .00$). When holding age and educational level constant, adolescents who had stronger enhancement motives were 2,5 times more likely to have binge drunk in the past month. Coping motives were not significantly related to BD. In step 2 (Table 3, model 2) and step 3 (Table 3, model 3) gender and frequency of alcohol use were respectively added to the

Table 2

Spearman Correlations for all Study Variables.

Variable	1	2	3	4	5	6	7	8	9	10	11
1 Age	-										
2 Educ. level	-.07*	-									
3 Gender	.00	-.00	-								
4 Freq AU	.54**	.00	.02	-							
5 EM[a]	.42**	.11	.01	.44**	-						
6 CM[a]	.21**	-.09	.10	.23**	.53**	-					
7 DN	.66**	-.02	.08**	.54**	.44**	.23**	-				
8 IN	.57**	.01	.00	.56**	.40**	.24**	.60**	-			
9 PM	-.19**	.07*	.14**	-.21**	.01	-.03	-.13**	-.21**	-		
10 ASR	-.59**	.01	-.06	-.68**	-.39**	-.18**	-.55**	-.62**	.25**	-	
11 BD	.44**	.01	.02	.63**	.45**	.20**	.46**	.46**	-.14**	-.47**	-

Note. N = 1006. Educ. level = educational level; Freq AU = frequency of alcohol use; EM = enhancement motives; CM = coping motives; DN = descriptive norms; IN = injunctive norms; PM = parental monitoring; ASR = alcohol-specific rules; BD = binge drinking

**p < .01 *p < .05

[a] *N* = 216

Table 3

Logistic Regression Analyses of Enhancement and Coping Motives on Binge Drinking.

Variables	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Age	1.48**	[1.19, 1.85]	1.49**	[1.19, 1.87]	1.38**	[1.10, 1.75]
Educ. level	0.72	[0.25, 2.04]	0.68	[0.23, 1.98]	0.57	[0.19, 1.75]
EM	2.51**	[1.66, 3.79]	2.88**	[1.63, 5.07]	2.55	[0.63, 10.45]
CM	0.84	[0.56, 1.25]	0.81	[0.48, 1.38]	0.25	[0.05, 1.23]
Gender			2.13	[0.38, 12.08]		
EM*gender			0.75	[0.33, 1.70]		
CM*gender			1.08	[0.49, 2.39]		
Freq AU					0.95	[0.75, 1.19]
EM*FreqAU					1.00	[0.88, 1.13]
CM*FreqAU					1.12	[0.97, 1.28]

Note. N = 216. OR = odds ratio; CI = confidence interval; Educ. level = educational level; EM = enhancement motives; CM = coping motives; Freq AU = frequency of alcohol use. Age and educational level are included as control variables.

** p<.01 * p<.05

model to test moderation effects. No significant interactions were found, meaning that the effects of enhancement and coping motives were not significantly different for boys versus girls and adolescents who have a high versus low frequency of alcohol use.

Peer Domain: Descriptive and Injunctive Norms

In the peer domain, the relationship between descriptive and injunctive norms on the BD prevalence among adolescents was investigated using logistic regression analyses. As shown (see Table 4), positive descriptive ($OR = 2.08$, $p < .00$) and injunctive ($OR = 1.43$, $p < .00$) norms were significantly related to BD (Table 4, model 1). Adolescents who had more positive descriptive and injunctive norms were respectively two times and 1,5 times more likely to have binge drunk in the past month, controlling for age and educational level. In addition, gender (Table 4, model 2) and frequency of alcohol use (Table 4, model 3) were separately included as moderators for the relationship between descriptive and injunctive norms on the BD prevalence among adolescents. No significant interactions were found, meaning that the effects of descriptive and injunctive norms were not significantly different for boys versus girls and adolescents who have a high versus low frequency of alcohol use.

Table 4

Logistic Regression Analyses of Descriptive and Injunctive Norms on Binge Drinking.

Variables	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Age	1.73**	[1.46, 2.04]	1.73**	[1.46, 2.05]	1.25*	[1.02, 1.53]
Educ. Level	0.84	[0.39, 1.79]	0.82	[0.38, 1.77]	0.84	[0.35, 2.06]
DN	2.08**	[1.62, 2.68]	2.08**	[1.47, 2.95]	2.15*	[1.19, 3.91]
IN	1.43**	[1.23, 1.66]	1.31**	[1.07, 1.61]	1.10	[0.76, 1.61]
Gender			0.53	[0.10, 2.80]		
DN*gender			1.02	[0.62, 1.66]		
IN*gender			1.23	[0.90, 1.67]		
Freq AU					1.50**	[1.24, 1.82]
DN* Freq AU					0.96	[0.90, 1.02]
IN* Freq AU					1.02	[0.98, 1.07]

Note. N = 1006. OR = odds ratio; CI = confidence interval; Educ. level = educational level; DN = descriptive norms; IN = injunctive norms; Freq AU = frequency of alcohol use. Age and educational level are included as control variables.
*** p<.01 * p<.05*

Parent Domain: Parental Monitoring and Alcohol-Specific Rules

In the parent domain, the relationship between parental monitoring and alcohol-specific rules on the BD prevalence among adolescents was investigated. The results indicated that alcohol-specific rules were significantly correlated with BD ($OR = 0.50$, $p < .00$; Table 5,

model 1). That is, adolescents whose parents set strict alcohol-specific rules are a half time less likely to have binge drunk in the past month, holding age and educational level constant. Parental monitoring was not significantly related to BD. In further analyses, gender (Table 5, model 2) and frequency of alcohol use (Table 5, model 3) were separately included as moderators for the association between parental monitoring and alcohol-specific rules on the BD prevalence among adolescents. No significant interactions were found, meaning that the effects of parental monitoring and alcohol-specific rules were not significantly different for boys versus girls and adolescents who have a high versus low frequency of alcohol use.

Table 5

Logistic Regression Analyses of Descriptive and Injunctive Norms on Binge Drinking.

Variables	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Age	1.79**	[1.52, 2.11]	1.80**	[1.53, 2.13]	1.47**	[1.21, 1.79]
Educ. Level	0.82	[0.39, 1.72]	0.81	[0.38, 1.70]	0.78	[0.31, 1.94]
PM	0.90	[0.72, 1.13]	0.94	[0.69, 1.28]	1.17	[0.63, 2.16]
ASR	0.51**	[0.42, 0.61]	0.55**	[0.43, 0.71]	0.71	[0.42, 1.18]
Gender			2.62	[0.35, 19.34]		
PM*gender			0.90	[0.56, 1.43]		
ASR*gender			0.86	[0.61, 1.22]		
Freq AU					1.37*	[1.05, 1.80]
PM*Freq AU					0.98	[0.92, 1.04]
ASR*Freq AU					1.03	[0.98, 1.08]

Note. $N = 1006$. OR = odds ratio; CI = confidence interval; Educ. level = educational level; PM = parental monitoring; ASR = alcohol-specific rules; Freq AU = frequency of alcohol use. Age and educational level are included as control variables.
** p<.01 * p<.05

Whole Model: Significant Factors From all Domains

Lastly, all significant factors per domain were analyzed in one regression model (see Table 6). It was found that enhancement motives ($OR = 1.99$, $p < .00$) and injunctive norms ($OR = 1.31$, $p = .04$) significantly related to the BD prevalence among adolescents: adolescents who had stronger enhancement motives and more positive injunctive norms were respectively two times and around 1.5 times more likely to have binge drunk in the past month. The associations between descriptive norms and alcohol-specific rules on adolescents' BD became insignificant. These results indicate that enhancement motives and injunctive norms are the main factors contributing to the BD prevalence among adolescents.

Table 6

Logistic Regression Analysis of all Significant Factors for Adolescents' Binge Drinking in the Individual, Peer, and Parent Domain.

Variable	B	OR	95% CI
Control variables			
Age	.36	1.44*	[1.09, 1.89]
Educational level	-.61	0.94	[0.33, 2.72]
Predictors			
Enhancement motives	.69	1.99**	[1.37, 2.91]
Descriptive norms	.25	1.28	[0.88, 1.86]
Injunctive norms	.27	1.31*	[1.00, 1.72]
Alcohol-specific rules	.15	1.16	[0.84, 1.61]

Note. N = 216. OR = odds ratio; CI = confidence interval.
*** p<.01 * p<.05*

Discussion

The aim of the present study was to gain insight into factors that contribute to binge drinking (BD) among adolescents in Nieuwegein. Specifically, it was expected that factors in the individual (enhancement and coping motives), peer (descriptive and injunctive norms), and parent (alcohol-specific rules and parental monitoring) domain significantly relate to the BD prevalence among adolescents. It was hypothesized that gender and frequency of alcohol use moderate these predictor-BD links. Study findings per domain demonstrate that enhancement motives and positive descriptive and injunctive norms increased the likelihood to engage in BD, while strict alcohol-specific rules decreased the likelihood to engage in BD. Moderation analyses showed similar results for boys and girls, and for adolescents with a high and low frequency of alcohol use. Taking into account all significant factors across domains, it was found that enhancement motives and injunctive norms are the main factors contributing to the BD prevalence among adolescents. Altogether, these findings show the importance of individual and peer factors on the BD prevalence among adolescents in Nieuwegein.

Outcomes of Individual, Peer, and Parent Factors on Binge Drinking

Regarding individual factors, the results showed that stronger enhancement motives increased the likelihood of having binge drunk in the past month, whereas coping motives did not. Though a significant correlation between coping motives and BD was found, analyses demonstrated the stronger effect of enhancement motives. While not supporting the hypotheses, these results are consistent with previous studies showing that only enhancement motives contribute to adolescents' BD (Kuntsche et al., 2005; Laghi et al., 2019; Lannoy et al., 2019; Pompili & Laghi, 2019) while other drinking motives are mostly related to other

drinking patterns (Bergagna & Tartaglia, 2019; Kuntsche et al., 2005, 2014; Merrill et al., 2014; Sjödin et al., 2021). It is likely that adolescents are mostly driven to engage in BD for reasons of internal enjoyment (e.g., pleasure, feeling happy; Cerasoli et al., 2014; Kuntsche et al., 2005). Only enhancement motives are able to meet such reasons, thereby explaining the unique predicting effect of enhancement motivation on adolescents' BD.

In the peer domain, the role of descriptive and injunctive norms on BD was investigated. As hypothesized, it was found that adolescents who think their friends drink alcohol and approve of drinking alcohol are more likely to have binge drunk in the past month. This is consistent with previous studies indicating that descriptive and injunctive peer norms are linked to heavy drinking in adolescence (e.g., Edwards et al., 2021; Pilatti et al., 2021; Voogt et al., 2013). Most likely, these norms signal which behaviors are accepted by peers and would lead to positive rewards (e.g., social acceptance; McAlaney et al., 2015; Vallentin-Holbech et al., 2017). Since adolescents are susceptible to such peer rewards (Steinberg, 2017), there is a greater likelihood they engage in BD if they think it is normal among and accepted by their peers. This way, peer norms are a form of peer influence.

In the parent domain, strict alcohol-specific rules, but not parental monitoring, decreased the likelihood of having binge drunk in the past month. Though parental monitoring significantly correlated with BD, analyses demonstrated the stronger effect of alcohol-specific rules. While this is not in line with the expectation, these results are consistent with existing literature suggesting a stronger effect of alcohol-specific parenting practices than general parenting practices on adolescents' alcohol use (Handley & Chassin, 2013; van der Zwaluw et al., 2008; van Zundert et al., 2006). It might be that parents, through their alcohol-specific parenting practices, convey a negative (implicit) norm about alcohol use (van Zundert et al., 2006), which in turn could withhold adolescents from (binge) drinking (Payne et al., 2016). General parenting practices, however, do not, or to a lesser extent, convey such norms as they are more focused on various adolescent(-parent relationship) outcomes (Yap et al., 2017). By lacking the norm-setting role, the effect of general parenting practices (e.g., monitoring) on adolescents' BD may be overshadowed by alcohol-specific parenting practices (e.g., rules).

Main Predictors

Taking all significant factors per domain (enhancement motives, descriptive norms, injunctive norms, and alcohol-specific rules) together, stronger enhancement motives and more positive injunctive norms remained significant. Both of these factors are from the individual and peer domain, whereas the parental factor became insignificant. An explanation for these findings is the changing role of various factors during adolescence. Until the age of

14, (alcohol-specific) parenting practices are related to less alcohol use, but this effect disappears for older adolescents (van der Zwaluw et al., 2008). As Dutch adolescents' BD on average starts around the age of 15 (Rombouts et al., 2020), this suggests that parents of Dutch adolescents mostly affect the onset of drinking instead of BD (van der Vorst et al., 2007; van der Zwaluw et al., 2008). On top of that, the influence of individual and peer factors increases as adolescents get older (Steinberg, 2017; van der Zwaluw et al., 2008; Wray-Lake, 2010). All findings considered, it seems that parents play an important role in the initiation phase of alcohol use while for higher levels of alcohol use (e.g., BD) individual and parent factors may be more influential.

Moderation: Gender and Frequency of Alcohol Use

To gain more insight into the predictor-BD links, the moderating role of gender and frequency of alcohol use was investigated. No significant moderation effects of gender and frequency of alcohol use were found for all predictor-BD links. For gender, this means that the underlying factors for adolescents' BD are the same for boys and girls. Even though this does not support the hypothesis, the findings could explain why recent years show a reduction in gender differences in adolescents' alcohol use (Johnston et al., 2020). That is, it seems that similar factors contribute to BD among boys and girls. Regarding frequency of alcohol use, results point to significant relationships of all predictors on frequency of alcohol use, however, contrary to expectations, it was not a significant moderator for the predictor-BD links. This means that the frequency of alcohol use does not significantly increase or decrease the effect of drinking motives, social norms, and (alcohol-specific) parenting practices on adolescents' BD. Instead, it appears to be a direct predictor of adolescents' BD.

Strengths and Limitations

The main strength of the present study is the use of an interdisciplinary approach to adolescents' BD. Previous studies have been limited to demonstrating either which distal and proximal factors from multiple domains (e.g., Grevenstein et al., 2020) or which proximal factors in one domain contribute to adolescents' BD (e.g., Yap et al., 2017). By focusing on proximal factors in three domains (individual, peers, and parents), the current study attempted to gain more insight into factors that are relevant for the prevention of adolescents' BD.

Despite this strength, the results should be considered in light of some limitations. One limitation is the use of cross-sectional data, making it impossible to draw causal inferences. Previous longitudinal studies, however, demonstrated the predicting effects of enhancement motives (Lannoy et al., 2019), descriptive and injunctive norms (Voogt et al., 2013), and

alcohol-specific rules (Janssen et al., 2014; Mares et al., 2012; Østergaard et al., 2018) on adolescents' BD, making it likely that the results of this research (partly) reflect the effect of these factors on adolescents' BD. Furthermore, including age and educational level as control variables, and gender and frequency of alcohol use as moderators, may have ruled out some alternative explanations. Nevertheless, future longitudinal research is needed to clarify the results. Other limitations are the use of a select sample and the limited generalizability of the sample. Of note, this study intentionally focused on adolescents in Nieuwegein for the purpose of local interventions. The used sampling method and sample contributed to gaining more insight into factors contributing to adolescents' BD in Nieuwegein, which enables the development or refinement of local interventions.

Implications

The present findings have implications for academia and prevention. For academia, the current study provides new insights into factors that contribute to adolescents' BD. In particular, the results point to the importance of individual and peer factors in increasing the BD prevalence among adolescents. For prevention, the results can guide prevention workers toward the development of effective interventions. For now, the municipality of Nieuwegein has some interventions that target adolescents' BD, however, these lack a match with the determinants arising from this study (see Jellinek, z.d.; Nederlands Jeugdinstituut, 2021; Stichting Chris en Voorkom, 2020). Therefore, prevention workers should focus on (existing) interventions that relate to the relevant factors affecting adolescents' BD. Moreover, they should investigate which kinds of interventions are needed, how to deliver them, and in which setting (Kuntsche et al., 2017). In doing these things, it is important for prevention workers to work together with parties that can bring about behavior change among adolescents (e.g., schools, municipal health services, local addiction treatment facilities; Ministerie van Volksgezondheid, Welzijn en Sport, z.d.). When taking all this into consideration, it is possible to create multi-level interventions that are pressed to be needed for complex problems as adolescents' BD.

Conclusion

The results of the current study revealed a set of individual, peer, and parent factors that correlate with adolescents' BD. Findings per domain showed that enhancement motives, descriptive norms, and injunctive norms are significant predictors for the BD prevalence among adolescents in Nieuwegein, while strict alcohol-specific rules are a protective factor. When taking all these factors together, only stronger enhancement motives (individual) and

more positive injunctive norms (peers) remained significant. Many Dutch adolescents engage in BD at least once a month, increasing the risk for several detrimental (mental) health consequences. Changing adolescents' motivations for alcohol use as well as the way they think their peers approve of alcohol use may be important targets for preventive interventions aiming to decrease the BD prevalence among adolescents in Nieuwegein. This way, adolescents could be protected from BD and its related (mental) health consequences.

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Yap, M. B., Cheong, T. W., Zaravinos-Tsakos, F., Lubman, D. I., & Jorm, A. F. (2017). Modifiable parenting factors associated with adolescent alcohol misuse: A systematic review and meta-analysis of longitudinal studies. *Addiction*, *112*(7), 1142-1162. https://doi.org/10.1111/add.13785

Appendix A: Interdisciplinarity

The current study applied an interdisciplinary approach to investigate which factors contributed to the BD frequency among adolescents in Nieuwegein. By doing this, it used theories and concepts from various (sub-)disciplines and looked at factors in different contexts (person, group, or society; Sameroff, 2009). By implementing these theories, constructs, and factors from different (sub-)disciplines and contexts in one theoretical model, a greater and interdisciplinary understanding of adolescents' BD and factors contributing to it could be acquired. This, in turn, is important for making effective interventions for the prevention of adolescents' BD.

Theories and concepts from (sub-)disciplines that are central are derived from developmental psychology, psychology, social psychology, and pedagogics. For instance, reasons for studying the adolescent population are derived from developmental psychological insights showing that adolescents are at risk for engaging in risky behaviors (e.g., BD; Geier, 2013), and for experiencing adverse outcomes of engaging in BD (e.g., Adan et al., 2016). For the three domains, theories and concepts from different (sub-)disciplines were chosen because they have been shown among the strongest and most proximal ones affecting adolescents' BD. Firstly, this research examined whether enhancement and/or coping motives influence adolescents' BD by applying the motivational model (psychology). Secondly, the concepts of descriptive and injunctive norms, derived from social psychology, were included in the model (see Figure 1) to study the role of peer norms on adolescents' BD. It thereby scrutinizes the potential effect of others on an individual's behavior, which is the focus of social psychology (Allport, 1985). Lastly, the role of parents was studied (social psychology). Here, parental monitoring and alcohol-specific rules (pedagogics) were included in the model to study the role of parenting practices on adolescents' behavior, which is one of the goals of pedagogics.

The factors depicted in the model in Figure 1 are located in different contexts, as described in Sameroff's transactional model of development (2009). Enhancement and coping motives are located in the person context while descriptive norms, injunctive norms, parental monitoring, and alcohol-specific rules are located in the group context. Factors in both contexts could interact with each other. That is, drinking motives could be influenced by more external factors (e.g., social peer norms). Factors within one context could also interact with each other, as Wood et al. (2004) showed that parent influences moderate the relation between peer influences and adolescents' drinking behaviors. Therefore, it seems that factors in different contexts, as well as within contexts, interact with each other to affect adolescents' BD, making it even more important to apply an interdisciplinary approach.

Appendix B: SPSS Syntax

* Encoding: UTF-8.

*Openen bronbestand Welzijn Nieuwegein dataset.

GET

  FILE='U:\My Documents\Masterproject binge drinken\Welzijn

Nieuwegein_ElianneVlieg.sav'.

DATASET NAME DataSet1 WINDOW=FRONT.

*Werken in kopie, opslaan onder nieuwe naam.

SAVE OUTFILE='U:\My Documents\Masterproject binge drinken\Vlieg Elianne thesis YS

2022.sav'

  /COMPRESSED.

***BASICS VAN OUTPOUT CONTROLEREN EN AANPASSEN.

*Geef iedereen een uniek respondentnummer.

COMPUTE Respondentnummer=$casenum.

FORMATS Respondentnummer (F8.0).

VARIABLE LABELS Respondentnummer Respondentnummer.

EXECUTE.

*Verwijderen van variabelen die niet nodig zijn voor het onderzoek.

DELETE VARIABLES

  V19_2, V19_3, V20_1, V54_1, V54_4, V54_5, Q101_2, Q101_6, Q101_8, Q101_9,

Q101_11, Q101_12.

*Hernoemen variabelen in type + volgnummer.

RENAME VARIABLES (age_def = Leeftijd).

RENAME VARIABLES (V4 = Geslacht).

RENAME VARIABLES (V6 = Opleidingsniveau).

RENAME VARIABLES (V19_1 = PrevalentieAlcoholgebruik).

RENAME VARIABLES (V20_2 = BingeDrinken).

RENAME VARIABLES (V53_1 TO V53_4 = InjunctieveNormen01 TO

InjunctieveNormen04).

RENAME VARIABLES (V54_2 TO V54_3 = DescriptieveNormen01 TO DescriptieveNormen02).

RENAME VARIABLES (V37_1 TO V37_5 = OuderlijkeMonitoring01 TO OuderlijkeMonitoring05).

RENAME VARIABLES (V40_1 TO V40_5 = AlcoholSpecifiekeRegels01 TO AlcoholSpecifiekeRegels05).

RENAME VARIABLES (Q101_1, Q101_3, Q101_10 = EnhancementMotives01 TO EnhancementMotives03).

RENAME VARIABLES (Q101_4, Q101_5, Q101_7 = CopingMotives01 TO CopingMotives03).

*Variabele labels toevoegen.
VARIABLE LABELS Leeftijd Wanneer ben je geboren?.

*Meetniveaus aanpassen van scale naar nomiaal of ordinaal.
VARIABLE LEVEL Geslacht, Respondentnummer (NOMINAL).
VARIABLE LEVEL Opleidingsniveau TO EnhancementMotives03 (ORDINAL).

**Tussentijds opslaan.
SAVE OUTFILE='U:\My Documents\Masterproject binge drinken\Vlieg Elianne thesis YS 2022.sav'
  /COMPRESSED.

***DATA OPSCHONEN (MISSINGS, VALUES, UNRELIABLE RESPONDENTS & OUTLIERS).

*Inspectie van variabelen met descriptive statisitics.
DESCRIPTIVES VARIABLES=Leeftijd Geslacht Opleidingsniveau
PrevalentieAlcoholgebruik BingeDrinken
   InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03 InjunctieveNormen04
   DescriptieveNormen01 DescriptieveNormen02 OuderlijkeMonitoring01
OuderlijkeMonitoring02
   OuderlijkeMonitoring03 OuderlijkeMonitoring04 OuderlijkeMonitoring05
AlcoholSpecifiekeRegels01

AlcoholSpecifiekeRegels02 AlcoholSpecifiekeRegels03 AlcoholSpecifiekeRegels04

AlcoholSpecifiekeRegels05 EnhancementMotives01 EnhancementMotives02

CopingMotives01 CopingMotives02

CopingMotives03 EnhancementMotives03

/STATISTICS=MEAN STDDEV MIN MAX.

*Let op: leeftijd tot 20 i.p.v. 17.

*Inspectie van variabelen met frequencies.

FREQUENCIES VARIABLES=Leeftijd Geslacht Opleidingsniveau

PrevalentieAlcoholgebruik BingeDrinken

InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03 InjunctieveNormen04

DescriptieveNormen01 DescriptieveNormen02 OuderlijkeMonitoring01

OuderlijkeMonitoring02

OuderlijkeMonitoring03 OuderlijkeMonitoring04 OuderlijkeMonitoring05

AlcoholSpecifiekeRegels01

AlcoholSpecifiekeRegels02 AlcoholSpecifiekeRegels03 AlcoholSpecifiekeRegels04

AlcoholSpecifiekeRegels05 EnhancementMotives01 EnhancementMotives02

CopingMotives01 CopingMotives02

CopingMotives03 EnhancementMotives03

/ORDER=ANALYSIS.

*Opvallend: veel missings bij drinkmotieven, geen ronde getallen bij leeftijd, missings op demografische variabelen.

**Recoding.

*Hercoderen leeftijd in 12 tm 20.

RECODE Leeftijd (11=11) (12=12) (12.10=12) (13=13) (14=14) (14.30=14) (15=15) (15.60=16) (16=16)

(16.60=17) (17=17) (17.20=17) (18=18) (19=19) (20=20) INTO Leeftijd_R.

VARIABLE LABELS Leeftijd_R 'Wanneer ben je geboren?'.

FREQUENCIES Leeftijd Leeftijd_R.

EXECUTE.

*Is goed gegaan, 60 missings.

*Hercoderen geslacht in jongens (=0) en meisjes (=1).

RECODE Geslacht (1=0) (2=1) INTO Geslacht_R.

VARIABLE LABELS Geslacht_R 'Ben je een jongen of meisje?'.

FREQUENCIES geslacht geslacht_r.

VALUE LABELS Geslacht_R 0 'jongen' 1 'meisje'.

EXECUTE.

*Is goed gegaan, 58 missings.

*Hercoderen opleidingsniveau in VMBO/HAVO (=0) en HAVO/VWO (=1).

RECODE Opleidingsniveau (1=0) (2=0) (3=0) (4=1) (5=1) (6=1) INTO Opleidingsniveau_R.

VARIABLE LABELS Opleidingsniveau_R 'Welk onderwijs volg je?'.

FREQUENCIES Opleidingsniveau Opleidingsniveau_R.

VALUE LABELS Opleidingsniveau_R 0 'VMBO/HAVO' 1 'HAVO/VWO'.

EXECUTE.

*Is goed gegaan, 62 missings.

*Hercoderen prevalentiealcoholgebruik in niet (=0) en teminste 1 keer (=1).

RECODE PrevalentieAlcoholgebruik (1=0) (2 thru HIGHEST=1) INTO Lifeprevalc.

VARIABLE LABELS Lifeprevalc 'Hoe vaak heb je minstens één glas alcohol gedronken? - In je hele leven'.

FREQUENCIES PrevalentieAlcoholgebruik Lifeprevalc.

VALUE LABELS Lifeprevalc 0 'nooit' 1 'ten minste één keer'.

*Is goed gegaan, 162 missings.

*Coderen bingedrinken in niet (=0) en tenminste 1 keer (=1).

RECODE BingeDrinken (1=0) (2 thru highest=1) into BD.

VARIABLE LABELS BD 'Hoe vaak heb je VIJF OF MEER drankjes (met alcohol) gedronken bij één gelegenheid? Bijvoorbeeld op een feestje, met uitgaan of avond thuis. - In de laatste 4 weken'.

FREQUENCIES BingeDrinken BD.

VALUE LABELS BD 0 'nooit' 1 'ten minste één keer'.

*Is goed gegaan, 162 missings.

*Ompolen van variabelen; injunctieve normen en alcohol-specifieke regels).

RECODE InjunctieveNormen04 (1=7) (2=6) (3=5) (4=4) (5=3) (6=2) (7=1) INTO
InjunctieveNormen04_R.
VARIABLE LABELS InjunctieveNormen04_R 'Geef aan of jouw vrienden of vriendinnen
de volgende '+
    'dingen volgens jou goedkeuren of afkeuren. -Besluiten om geen alcohol te drinken'.
FREQUENCIES InjunctieveNormen04 InjunctieveNormen04_R.
VALUE LABELS InjunctieveNormen04_R 1 '7' 2 '6' 3 '5' 4 '4' 5 '3' 6 '2' 7 '1'.
EXECUTE.
*Is goed gegaan, 234 missings.

RECODE AlcoholSpecifiekeRegels01 AlcoholSpecifiekeRegels02
AlcoholSpecifiekeRegels03
    AlcoholSpecifiekeRegels04 AlcoholSpecifiekeRegels05 (1=5) (2=4) (3=3) (4=2) (5=1)
INTO
    AlcoholSpecifiekeRegels01_R AlcoholSpecifiekeRegels02_R
AlcoholSpecifiekeRegels03_R
    AlcoholSpecifiekeRegels04_R AlcoholSpecifiekeRegels05_R.
VARIABLE LABELS AlcoholSpecifiekeRegels01_R '- Ik mag thuis één glas alcohol
drinken als mijn '+
    'ouders thuis zijn.' /AlcoholSpecifiekeRegels02_R '- Ik mag thuis meerdere glazen alcohol
'+
    'drinken als mijn ouders thuis zijn.' /AlcoholSpecifiekeRegels03_R ' - Ik mag thuis alcohol
'+
    'drinken als mijn ouders afwezig zijn.' /AlcoholSpecifiekeRegels04_R '- Ik mag op een
feestje '+
    'alcohol drinken met mijn vrienden.' /AlcoholSpecifiekeRegels05_R '- Ik mag in het
weekend '+
    'alcohol drinken.'.
FREQUENCIES AlcoholSpecifiekeRegels01 TO AlcoholSpecifiekeRegels05
AlcoholSpecifiekeRegels01_R TO AlcoholSpecifiekeRegels05_R.
VALUE LABELS AlcoholSpecifiekeRegels01_R TO AlcoholSpecifiekeRegels05_R 1 'zeker
wel' 2 'waarschijnlijk wel' 3 'soms' 4 'waarschijnlijk niet' 5 'zeker niet'.
EXECUTE.
*Is goed gegaan, 216 missings op alle items.

*Overbodige decimalen verwijderen.

FORMATS Leeftijd_R TO AlcoholSpecifiekeRegels05_R (F8.0).

*Meetniveaus aanpassen van scale naar ordinaal.

VARIABLE LEVEL Opleidingsniveau_R TO AlcoholSpecifiekeRegels05_R (ORDINAL).

**Missings.

*Uitfilteren en verwijderen leeftijd buiten age range 11-17 jaar.

TEMPORARY.

SELECT IF (Leeftijd_R = 11 OR Leeftijd_R = 12 OR Leeftijd_R = 13 OR Leeftijd_R = 14

OR Leeftijd_R = 15 OR Leeftijd_R = 16 OR Leeftijd_R = 17).

FREQUENCIES Leeftijd_R.

EXECUTE.

*120 buiten age range.

SELECT IF (Leeftijd_R = 11 OR Leeftijd_R = 12 OR Leeftijd_R = 13 OR Leeftijd_R = 14

OR Leeftijd_R = 15 OR Leeftijd_R = 16 OR Leeftijd_R = 17).

 FREQUENCIES Leeftijd_R.

*Is goed gegaan. Sample = 1180.

*Uitfilteren en verwijderen missings op demografische variabelen.

TEMPORARY.

SELECT IF (Leeftijd_R Geslacht_R Opleidingsniveau_R ne 99999).

FREQUENCIES Leeftijd_R Geslacht_R Opleidingsniveau_R.

EXECUTE.

*1 missing opleidingsniveau.

SELECT IF (Leeftijd_R ne 99999).

SELECT IF (Geslacht_R ne 99999).

SELECT IF (Opleidingsniveau_R ne 99999).

FREQUENCIES Leeftijd_R Geslacht_R Opleidingsniveau_R.

*Is goed gegaan, 0 missings op demografische variaebelen. Sample = 1179.

*Uitfilteren en verwijderen missings op BD.

TEMPORARY.

SELECT IF (BD ne 99999).

FREQUENCIES BD.

EXECUTE.

*94 missings.

SELECT IF (BD ne 99999).

FREQUENCIES BD.

Is goed gegaan, 0 missings op BD. Sample = 1085.

*Uitfilteren en verwijderen missings op BD.

TEMPORARY.

SELECT IF (BD ne 99999).

FREQUENCIES BD.

EXECUTE.

*94 missings.

SELECT IF (BD ne 99999).

FREQUENCIES BD.

*Is goed gegaan, 0 missings op BD. Sample = 1085.

*Aanmaken schalen, missings eruit halen (min. 50% ingevuld).

*Injunctieve normen.

COMPUTE IN = mean.2(InjunctieveNormen01, InjunctieveNormen02,

InjunctieveNormen03, InjunctieveNormen04_R).

VARIABLE LABELS IN 'Gemiddelde score InjunctieveNormen01, InjunctieveNormen02,

InjunctieveNormen03 & InjunctieveNormen04_R'.

FREQUENCIES IN.

EXECUTE.

*71 missings.

TEMPORARY.

SELECT IF (IN ne 99999).

FREQUENCIES IN.

EXECUTE.

*Goed gegaan, sample = 1014 dus 71 eraf.

SELECT IF (IN ne 99999).

FREQUENCIES IN.

*Is goed gegaan, 0 missings op injunctive. Sample = 1014.

*Descriptive norms.

COMPUTE DN = mean.2(DescriptieveNormen01, DescriptieveNormen02).

VARIABLE LABELS DN 'Gemiddelde score DescriptieveNormen01,

DescriptieveNormen02'.

FREQUENCIES DN.

EXECUTE.

*Geen missings, niet nodig om respondenten te verwijderen.

*Ouderlijke monitoring.

COMPUTE OM = mean.3(OuderlijkeMonitoring01, OuderlijkeMonitoring02,

OuderlijkeMonitoring03, OuderlijkeMonitoring04, OuderlijkeMonitoring05).

VARIABLE LABELS OM 'Gemiddelde score OuderlijkeMonitoring01 tot

OuderlijkeMonitoring05'.

FREQUENCIES OM.

EXECUTE.

*0 missings, niet nodig om respondenten te verwijderen.

*Alcohol-specifieke regels.

COMPUTE ASR = mean.3(AlcoholSpecifiekeRegels01_R, AlcoholSpecifiekeRegels02_R,

AlcoholSpecifiekeRegels03_R, AlcoholSpecifiekeRegels04_R,

AlcoholSpecifiekeRegels05_R).

VARIABLE LABELS ASR 'Gemiddelde score AlcoholSpecifiekeRegels01_R tot

AlcoholSpecifiekeRegels05_R'.

FREQUENCIES ASR.

EXECUTE.

*0 missings, niet nodig om respondenten te verwijderen.

*Enhancement motives.

COMPUTE EM = mean.2(EnhancementMotives01, EnhancementMotives02,

EnhancementMotives03).

VARIABLE LABELS EM 'Gemiddelde score EnhancementMotives01,

EnhancementMotives02, EnhancementMotives03'.

FREQUENCIES EM.

EXECUTE.

*798 missings, niet verwijderen maar subsample.

*Coping motives.

COMPUTE CM = mean.2(CopingMotives01, CopingMotives02, CopingMotives03).

VARIABLE LABELS CM 'Gemiddelde score CopingMotives01, CopingMotives02,

CopingMotives03'.

FREQUENCIES CM.

EXECUTE.

*798 missings, niet verwijderen maar subsample samen met enhancement.

*Unreliable respondents.

*Verwijderen unreliable respondents (alleen laagtste ingevuld).

TEMPORARY.

SELECT IF Respondentnummer NE 1 AND Respondentnummer NE 8 AND

Respondentnummer NE 14 AND Respondentnummer NE 347 AND Respondentnummer NE

381 AND Respondentnummer NE 507 AND Respondentnummer

   NE 722 AND Respondentnummer NE 1169.

FREQUENCIES Respondentnummer.

EXECUTE.

*Goed gegaan, 8 respondenten verwijderd.

SELECT IF Respondentnummer NE 1 AND Respondentnummer NE 8 AND

Respondentnummer NE 14 AND Respondentnummer NE 347 AND Respondentnummer NE

381 AND Respondentnummer NE 507 AND Respondentnummer

   NE 722 AND Respondentnummer NE 1169.

FREQUENCIES Respondentnummer.

EXECUTE.

*Sample = 1006.

*Outliers.

*Checken voor outliers met cook's, mahalanobis, leverage en StdDFBeta.

DATASET ACTIVATE DataSet1.

REGRESSION

  /MISSING PAIRWISE

  /STATISTICS COEFF OUTS R ANOVA

  /CRITERIA=PIN(.05) POUT(.10)

  /NOORIGIN

  /DEPENDENT BD

  /METHOD=ENTER IN OM ASR EM CM DescriptieveNormen01 DescriptieveNormen02

Geslacht_R Lifeprevalc

  /SCATTERPLOT=(*ZPRED ,*ZRESID)

  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)

  /SAVE MAHAL COOK LEVER SDBETA.

*Opvragen descriptives Mahal, Cook, Lever, SDBETA.

DESCRIPTIVES VARIABLES=MAH_1 COO_1 LEV_1 SDB0_1 SDB1_1 SDB2_1

SDB3_1 SDB4_1 SDB5_1 SDB6_1 SDB7_1

   SDB8_1 SDB9_1

  /STATISTICS=MEAN STDDEV MIN MAX.

*Geen outlier op Cook's, wel op Mahalanobis en leverage. Geen waardes van 1 op

SDBETA's, dus geen extreem invloedrijke cases. Alles behouden.

*Verwijderen Mahal, Cook, Lever, SDBETA variabelen.

DELETE VARIABLES MAH_1 TO SDB9_1.

*Betrouwbaarheidsanalyses.

*Betrouwbaarheidsanalyse injunctive norms.

DATASET ACTIVATE DataSet1.

RELIABILITY

  /VARIABLES=InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03

InjunctieveNormen04_R

  /SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/SUMMARY=TOTAL.

*Cronbach's Alpha = .447. Bij verwijderen van InjunctieveNormen04_R naar .830.

RELIABILITY

/VARIABLES=InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/SUMMARY=TOTAL.

*Klopt. Cronbach's alpha = .830.

*Correlatie (betrouwbaarheid) descriptive norms.

CORRELATIONS

/VARIABLES=DescriptieveNormen01 DescriptieveNormen02

/PRINT=TWOTAIL NOSIG FULL

/MISSING=PAIRWISE.

Pearson correlatie = .864, p = < .001.

*Betrouwbaarheidsanalyse ouderlijke monitoring.

RELIABILITY

/VARIABLES=OuderlijkeMonitoring01 OuderlijkeMonitoring02 OuderlijkeMonitoring03

OuderlijkeMonitoring04 OuderlijkeMonitoring05

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/SUMMARY=TOTAL.

*Cronbach's Alpha = .848. Bij verwijderen van items gaat het niet omhoog.

*Betrouwbaarheidsnalyse alcohol-specifieke regels.

RELIABILITY

/VARIABLES=AlcoholSpecifiekeRegels01_R AlcoholSpecifiekeRegels02_R

AlcoholSpecifiekeRegels03_R

AlcoholSpecifiekeRegels04_R AlcoholSpecifiekeRegels05_R

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/SUMMARY=TOTAL.

*Cronbach's Alpha = .949. Bij verwijderen van items gaat het niet omhoog.

*Betrouwbaarheidsanalyse enhancement motives.
RELIABILITY
 /VARIABLES=EnhancementMotives01 EnhancementMotives02 EnhancementMotives03
 /SCALE('ALL VARIABLES') ALL
 /MODEL=ALPHA
 /SUMMARY=TOTAL.
*Cronbach's Alpha = .766. Bij verwijderen van items gaat het niet omhoog.

*Betrouwbaarheidsanalyse coping motives.
RELIABILITY
 /VARIABLES=CopingMotives01 CopingMotives02 CopingMotives03
 /SCALE('ALL VARIABLES') ALL
 /MODEL=ALPHA
 /SUMMARY=TOTAL.
*Cronbach's Alpha = .909. Bij verwijderen van items gaat het niet omhoog.

*Validiteit van schalen.

*Factoranalyse alle schalen.
FACTOR
 /VARIABLES InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03
InjunctieveNormen04_R
  OuderlijkeMonitoring01 OuderlijkeMonitoring02 OuderlijkeMonitoring03
OuderlijkeMonitoring04
  OuderlijkeMonitoring05 AlcoholSpecifiekeRegels01_R AlcoholSpecifiekeRegels02_R
  AlcoholSpecifiekeRegels03_R AlcoholSpecifiekeRegels04_R
AlcoholSpecifiekeRegels05_R
  EnhancementMotives01 EnhancementMotives02 EnhancementMotives03
CopingMotives01 CopingMotives02
  CopingMotives03
 /MISSING PAIRWISE

/ANALYSIS InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03
InjunctieveNormen04_R

  OuderlijkeMonitoring01 OuderlijkeMonitoring02 OuderlijkeMonitoring03
OuderlijkeMonitoring04

  OuderlijkeMonitoring05 AlcoholSpecifiekeRegels01_R AlcoholSpecifiekeRegels02_R

  AlcoholSpecifiekeRegels03_R AlcoholSpecifiekeRegels04_R
AlcoholSpecifiekeRegels05_R

  EnhancementMotives01 EnhancementMotives02 EnhancementMotives03
CopingMotives01 CopingMotives02

  CopingMotives03

 /PRINT INITIAL EXTRACTION ROTATION

 /FORMAT BLANK(.40)

 /CRITERIA MINEIGEN(1) ITERATE(25)

 /EXTRACTION PC

 /CRITERIA ITERATE(25)

 /ROTATION VARIMAX

 /METHOD=CORRELATION.

*InjunctieveNormen_R laadt niet hoog op de betreffende schaal. Overlap coping en
enhancement motives.

FACTOR

 /VARIABLES InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03

  OuderlijkeMonitoring01 OuderlijkeMonitoring02 OuderlijkeMonitoring03
OuderlijkeMonitoring04

  OuderlijkeMonitoring05 AlcoholSpecifiekeRegels01_R AlcoholSpecifiekeRegels02_R

  AlcoholSpecifiekeRegels03_R AlcoholSpecifiekeRegels04_R
AlcoholSpecifiekeRegels05_R

  EnhancementMotives01 EnhancementMotives02 EnhancementMotives03
CopingMotives01 CopingMotives02

  CopingMotives03

 /MISSING PAIRWISE

 /ANALYSIS InjunctieveNormen01 InjunctieveNormen02 InjunctieveNormen03

  OuderlijkeMonitoring01 OuderlijkeMonitoring02 OuderlijkeMonitoring03
OuderlijkeMonitoring04

  OuderlijkeMonitoring05 AlcoholSpecifiekeRegels01_R AlcoholSpecifiekeRegels02_R

AlcoholSpecifiekeRegels03_R AlcoholSpecifiekeRegels04_R
AlcoholSpecifiekeRegels05_R
  EnhancementMotives01 EnhancementMotives02 EnhancementMotives03
CopingMotives01 CopingMotives02
  CopingMotives03
 /PRINT INITIAL EXTRACTION ROTATION
 /FORMAT BLANK(.40)
 /CRITERIA MINEIGEN(1) ITERATE(25)
 /EXTRACTION PC
 /CRITERIA ITERATE(25)
 /ROTATION VARIMAX
 /METHOD=CORRELATION.
*Betere validiteit na verwijderen InjunctieveNormen04_R.

*Aanmaken nieuwe schaal injunctieve normen.
COMPUTE IN = mean.2(InjunctieveNormen01, InjunctieveNormen02,
InjunctieveNormen03).
VARIABLE LABELS IN 'Gemiddelde score InjunctieveNormen01, InjunctieveNormen02,
InjunctieveNormen03'.
FREQUENCIES IN.
EXECUTE.
*Geen missings.

***START ANALYSES.

*Opvragen descriptives, frequencies en correlaties van alle onderzochte variabelen.
FREQUENCIES VARIABLES= Leeftijd_R Opleidingsniveau_R Geslacht_R
PrevalentieAlcoholgebruik EM CM DN IN OM ASR BD
 /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN
 /ORDER=ANALYSIS.

DESCRIPTIVES VARIABLES= Leeftijd_R Opleidingsniveau_R Geslacht_R
PrevalentieAlcoholgebruik EM CM DN IN OM ASR BD
 /STATISTICS=MEAN STDDEV MIN MAX.

NONPAR CORR

  /VARIABLES= Leeftijd_R Opleidingsniveau_R Geslacht_R PrevalentieAlcoholgebruik EM

CM DN IN OM ASR BD

  /PRINT=SPEARMAN TWOTAIL NOSIG FULL

  /MISSING=PAIRWISE.

**Descriptives en correlaties jongens sample.

*Inschakelen filter voor jongens.

USE ALL.

COMPUTE filter_$=(Geslacht_R = 0).

VARIABLE LABELS filter_$ 'Geslach_R = 0 (FILTER)'.

VALUE LABELS filter_$ 1 'Not Selected' 0 'Selected'.

FORMATS filter_$ (f1.0).

FILTER BY filter_$.

EXECUTE.

*Controleren of filter goed is gegaan.

FREQUENCIES Geslacht_R.

*is goed gegaan, alleen jongens geselecteerd. Sample = 509

*Descriptives en frequencies van jongens.

DESCRIPTIVES PrevalentieAlcoholgebruik EM CM DN IN OM ASR BD

   /STATISTICS=MEAN STDDEV MIN MAX.

FREQUENCIES PrevalentieAlcoholgebruik EM CM DN IN OM ASR BD

   /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN

  /ORDER=ANALYSIS.

*uitschakelen filter voor jongens.

FILTER OFF.

USE ALL.

EXECUTE.

FREQUENCIES Geslacht_R.

**Descriptives en correlaties meiden sample.

*Inschakelen filter voor meisjes.

USE ALL.

COMPUTE filter_$=(Geslacht_R = 1).

VARIABLE LABELS filter_$ 'Geslach_R = 1 (FILTER)'.

VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.

FORMATS filter_$ (f1.0).

FILTER BY filter_$.

EXECUTE.

*Controleren of filter goed is gegaan.

FREQUENCIES Geslacht_R.

*is goed gegaan, alleen meisjes geselecteerd. Sample = 497.

*Descriptives en frequencies van meisjes.

DESCRIPTIVES PrevalentieAlcoholgebruik EM CM DN IN OM ASR BD

   /STATISTICS=MEAN STDDEV MIN MAX.

FREQUENCIES PrevalentieAlcoholgebruik EM CM DN IN OM ASR BD

   /STATISTICS=STDDEV MINIMUM MAXIMUM MEAN

 /ORDER=ANALYSIS.

*uitschakelen filter voor meisjes.

FILTER OFF.

USE ALL.

EXECUTE.

FREQUENCIES Geslacht_R.

*Toetsen of er significante genderverschillen zijn.

DATASET ACTIVATE DataSet1.

T-TEST GROUPS=Geslacht_R(0 1)

 /MISSING=ANALYSIS

 /VARIABLES=PrevalentieAlcoholgebruik EM CM DN IN OM ASR BD

/ES DISPLAY(TRUE)

/CRITERIA=CI(.95).

*Significante verschillen voor descriptive norms (p=.00) en parental monitoring (p=.00)

*Inschakelen filter voor alleen drinkers.

USE ALL.

COMPUTE filter_$=(Lifeprevalc = 1).

VARIABLE LABELS filter_$ 'Lifeprevalc = 1 (FILTER)'.

VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.

FORMATS filter_$ (f1.0).

FILTER BY filter_$.

EXECUTE.

*controleren of filter goed aan staat.

FREQUENCIES Lifeprevalc.

*Goed gegaan. Sample = 385.

*Frequencies van alleen drinkers voor BD.

FREQUENCIES VARIABLES=BD

/ORDER=ANALYSIS.

*245 nooit bingedronken (= 63.636364%), 140 bingedronken in laatste vier weken (=

36.363636%).

*uitschakelen filer voor alleen drinkers.

FILTER OFF.

USE ALL.

EXECUTE.

*Verwijderen filtervariabele.

DELETE VARIABLES filter_$.

**LOGISTISCHE REGRESSIE ANALYSES PER DOMEIN.

*Individual domain.

*controle variabelen.

LOGISTIC REGRESSION VARIABLES BD

 /METHOD=ENTER Leeftijd_R Opleidingsniveau_R

 /PRINT=CI(95)

 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age significant.

*controle variabelen + voorspellers.

LOGISTIC REGRESSION VARIABLES BD

 /METHOD=ENTER Leeftijd_R Opleidingsniveau_R EM CM

 /PRINT=CI(95)

 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*Age en EM significant.

*controle variabelen, voorspellers & gender interactie.

LOGISTIC REGRESSION VARIABLES BD

 /METHOD=ENTER Leeftijd_R Opleidingsniveau_R EM CM Geslacht_R EM*Geslacht_R

CM*Geslacht_R

 /PRINT=CI(95)

 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age en EM significant.

*controle variabelen, voorspellers & lifeprevalc interactie.

LOGISTIC REGRESSION VARIABLES BD

 /METHOD=ENTER Leeftijd_R Opleidingsniveau_R EM CM PrevalentieAlcoholgebruik

EM*PrevalentieAlcoholgebruik CM*PrevalentieAlcoholgebruik

 /PRINT=CI(95)

 /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age en EM significant.

*Peer domain.

*controle variabelen.

LOGISTIC REGRESSION VARIABLES BD

  /METHOD=ENTER Leeftijd_R Opleidingsniveau_R

  /PRINT=CI(95)

  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*Age signficant.

*controle variabelen + voorspellers.

LOGISTIC REGRESSION VARIABLES BD

  /METHOD=ENTER Leeftijd_R Opleidingsniveau_R DN IN

  /PRINT=CI(95)

  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age, IN, DN significant.

*controle variabelen, voorspellers & gender interactie.

LOGISTIC REGRESSION VARIABLES BD

  /METHOD=ENTER Leeftijd_R Opleidingsniveau_R DN IN Geslacht_R DN*Geslacht_R

IN*Geslacht_R

  /PRINT=CI(95)

  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age, IN, DN significant.

*controle variabelen, voorspellers & lifeprevalc interactie.

LOGISTIC REGRESSION VARIABLES BD

  /METHOD=ENTER Leeftijd_R Opleidingsniveau_R DN IN PrevalentieAlcoholgebruik

DN*PrevalentieAlcoholgebruik IN*PrevalentieAlcoholgebruik

  /PRINT=CI(95)

  /CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age significant.

*parent domain.

*controle variabelen.

LOGISTIC REGRESSION VARIABLES BD

  /METHOD=ENTER Leeftijd_R Opleidingsniveau_R

/PRINT=CI(95)

/CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*Age signficant.

*controle variabelen + voorspellers.

LOGISTIC REGRESSION VARIABLES BD

/METHOD=ENTER Leeftijd_R Opleidingsniveau_R OM ASR

/PRINT=CI(95)

/CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age en ASR significant.

*controle variabelen, voorspellers & gender interactie.

LOGISTIC REGRESSION VARIABLES BD

/METHOD=ENTER Leeftijd_R Opleidingsniveau_R OM ASR Geslacht_R

OM*Geslacht_R ASR*Geslacht_R

/PRINT=CI(95)

/CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age, en ASR significant.

*controle variabelen, voorspellers & lifeprevalc interactie.

LOGISTIC REGRESSION VARIABLES BD

/METHOD=ENTER Leeftijd_R Opleidingsniveau_R OM ASR PrevalentieAlcoholgebruik

OM*PrevalentieAlcoholgebruik ASR*PrevalentieAlcoholgebruik

/PRINT=CI(95)

/CRITERIA=PIN(.05) POUT(.10) ITERATE(20) CUT(.5).

*age significant.

*Gehele model met alle relevante factoren.

LOGISTIC REGRESSION VARIABLES BD

/METHOD=ENTER Leeftijd_R Opleidingsniveau_R EM DN IN ASR

/PRINT=CI(95)

/CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).

*Age, EM en IN blijven significant.

**Opslaan.

SAVE OUTFILE='U:\My Documents\Masterproject binge drinken\Vlieg Elianne thesis YS 2022.sav'

 /COMPRESSED.

Appendix C: Igitur-form

Information about your thesis
Please save this form, modify it and e-mail it to your supervisor together with the digital final version of your thesis. For further questions see: http://studion.fss.uu.nl/helpdesk/student/scrol

Student nummer:	6556493
Initials & prefixes:	Ms. F.N.
Family name:	Vlieg
Master:	Youth Studies

Begeleider

| Name supervisor/assesor: * | Ina Koning |
| Name 2th assesor: | Tom ter Bogt |

Scriptie

Title thesis: *	Relevant Individual, Peer, and Parent Factors for the Prevention of Adolescents' Binge Drinking
Language thesis: *	English
Abstract:	As prevalence rates for Dutch adolescents' binge drinking (BD) remain alarmingly high, the need for effective intervention strategies is rising. Therefore, it is important to identify risk factors from various domains that contribute to adolescents' BD. The current study investigated which factors in the individual (enhancement and coping motives), peer (descriptive and injunctive norms), and parent (alcohol-specific rules and parental monitoring) domain contributed to the BD prevalence among adolescents in a Dutch municipality, as well as the moderating role of gender and frequency of alcohol use. Dutch adolescents ($N = 1006$) aged 11 to 17 completed an online self-report questionnaire on drinking motives, social norms, (alcohol-specific) parenting practices, alcohol use, and BD. Logistic regression analyses per domain showed that stronger enhancement motives, and positive descriptive and injunctive norms increased the likelihood to engage in BD, while strict alcohol-specific rules decreased the likelihood to engage in BD. Together, only stronger enhancement motives (individual) and more positive injunctive norms (peers) remained significant. These findings have implications for the development of multi-level interventions that are pressed to be needed for complex problems as adolescents' BD.
Key words: (seperated by ;)	binge drinking, drinking motives, social norms, parenting practices, prevention
Make public: *	~~Yes~~/ **No**
Make public after date:	/

Ingevuld op: 07-06-22
Door: Femke Nelisa Vlieg   * = Obliged to fill in

Appendix D: Form for Research Activities

Registration Form: Research Activities for TED-students (in total 60 hrs)

Name: Elianne Vlieg

Student number: 6556493

Research Activities	Total number of Hours	Signature YS staff
Looking at which interventions there are in the municipality of Nieuwegein. Which determinants do they target? What is the relation between the determinants and binge drinking (literature search)	27	
Helping with the master's open day: preparing + responding to questions people ask during the YS open day	2	
Making an overview about digital interventions. Responding to the following questions: To which extent are digital interventions used? Are these new interventions or translations from offline to online interventions? What is the impact of digital interventions What impact do digital interventions have on people's participation .	31	
Total	**60**	