

UNIVERSITY OF TWENTE.

The Influence of Personality and Cultural Aspects on Binge Drinking and Excessive Gaming

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Abstract

Binge drinking can lead to serious consequences as blackouts, injuries, academic failure, car accidents, or hazardous sexual behavior. Excessive gaming, too, can lead to undesirable outcomes as academic failure, social isolation, or depression. This study attempts to investigate how personality and cultural variables serve as risk factors and if both problem behaviors belong to the same construct. The Twente Model of Binge Drinking serves as a guideline for investigation. Adolescents of 16-20 years of age (N=201) successfully completed the online- or paper-survey. The data showed that hopelessness/introversion and anxiety sensitivity are negatively correlated with binge drinking, whereas sensation seeking and impulsiveness were positively associated with drinking. Also, several cultural aspects are connected with binge drinking: the alcohol-related rules that parents provide, the respect the adolescent has towards his parents, leisure activities and visiting 'keten'. The rules and social-entertainment activities moderated the relationship of hopelessness and binge drinking. Impulsiveness and hopelessness were positively associated with gaming. It could not be concluded that both behaviors belong to one construct. Further investigation is needed to confirm these findings.

Samenvatting

Binge drinking kan erge gevolgen voor jongeren hebben. Voorbeelden zijn bewusteloosheid, letsels, academisch mislukking, auto-ongelukken of gevaarlijk seksueel gedrag. Ofwel excessief game gedrag niet aan een substantie gekoppeld is, kan ook dit zware gevolgen, als academisch mislukking, sociale isolatie, of depressie, hebben. Deze studie probeert om te onderzoeken hoe persoonlijkheid en culturele aspecten een rol spelen bij binge drinking en of binge drinking en excessief gamen een gedragsconstruct vormen. De Twente Model of Binge Drinking wordt al richtlijn gebruikt. N=201 jongeren tussen 16 en 20 jaren hebben succesvol mee gedaan en de online- of papierenversie van de vragenlijst ingevuld. De Data toont aan, dat hopelessness en anxiety sensitivity negatief gecorreleerd hebben met binge drinking. Impulsiveness and sensation seeking zijn echter positief associeert met drinken. Ook culturele aspecten hebben invloed op het drinkgedrag van jongeren. Regels over alcohol, die ouders opstellen, en het respect die kinderen tegenover hun ouders hebben beschermd voor binge drinking. Vrijtijdsactiviteiten en keetbezoeken hebben eveneens een invloed op binge drinking. De persoonlijkheidstrekken hopelessness en impulsiveness zijn positief gecorreleerd met gamen. Toch lijken beide probleem gedragen niet tot een construct te behoren omdat er geen andere relaties gevonden zijn. Verder onderzoek is nodig om deze resultaten te bevestigen.

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1 Introduction

The initiation of alcohol use (Johnston, O'Malley, Bachman, and Schellenberg, 2004) and excessive usage (Gmel, Rehm, and Kuntsche 2003; Tucker, Orlando, and Ellickson, 2003) occurs in adolescence in most of the cases. It is therefore reasonable to target prevention and intervention methods in this life time period, because the consequence of (constant) excessive use of alcohol can affect later life in many ways. Arata, Stafford, and Tims (2003) found that problems associated with alcohol usage include neglecting responsibilities due to drinking, getting into fights, acting badly, doing mean things, causing shame or embarrassment to someone, missing school or work, driving after drinking and engaging in sexual behavior one would not have engaged in otherwise. Other serious possible consequences are academic failure, fatal or non-fatal injuries, blackouts, suicide attempts, unintended pregnancies, sexually transmitted diseases and violence (Gmel, Rehm, and Kuntsche, 2003; Hingson, Heeren, Zakocs, Kopstein, and Wechsler, 2002; Perkins, 2002). Although adolescents are often widely informed about the potentially harmful outcomes of excessive alcohol usage, it is, shortly after caffeine, the most commonly used legal drug in the western countries (Morrison, Bennett, 2006). According to a recent Dutch study 59.9% of the 11 to 15 year olds have at least once used alcohol in their lives (Monshouwer, Malmberg, Overbeek, Lammers, Vollenbergh, and Engels, 2010). This is alarming when one considers that alcohol consumption in the Netherlands is legal for adolescents from 16 years on. It is therefore very important to inform prevention and treatment efforts of possible risk factors.

In research and literature the consumption of five, six or more units of alcohol consecutively is often referred to as binge drinking, which is the most frequent form of drinking alcohol among young people (Miller, Naimi, Brewer, and Jones, 2007) So if binge drinking is potentially that dangerous why do young people drink? Often they drink for social reasons and enjoyment, sometimes they drink for enhancement motives, and few drink for coping motives (Kuntsche, Knibbe, Gmel, and Engels, 2006). Even the country we live in can be a possible factor for binge drinking. The Netherlands, France, Germany, Italy and other south European countries are known as 'wet' cultures (Measham, 2006), where many people drink daily for relaxation, whereas in 'dry' countries like Britain people usually don't drink during the week but rather heavily consume alcohol at the weekend.

The 'Twente Model of Binge Drinking' (2010) identifies further risk factors for binge drinking among Dutch and English adolescents between 15 and 19 years of age. The model

shows cultural context, personality traits and demographics as ultimate determinants, indirectly affecting binge drinking through distal factors (previous binge drinking), which in turn influence proximal factors. Those proximal factors are illustrated as reflective pathway and impulsive pathway. The former contains the theory of planned behavior (Ajzen, 1991). This theory states that behavior is directly influenced by the intention towards the behavior itself. The intention, again, is formed through perceived behavioral control, attitude, the subjective norm and the descriptive norm. This theory is shown as the reflective pathway. This process is rather reasoned and conscious. The impulsive pathway, in turn, is formed by the social reactive ‘prototype willingness model’ (Hofmann, Friese, and Wiers, 2008). According to this model prototype favorability and prototype similarity influence willingness and willingness influences binge drinking.

In this study I will concentrate on the cultural influences and the personality traits as possible risk factors for binge drinking. In the model, cultural influences persist of two different groups: parenting and environment. Different parenting practices seem to have influence on the binge drinking behavior of young people. Van der Vorst, Engels, Meeus, Dekovic, and Van Leeuwe (2005) found that alcohol related communication between parents and child is related with the frequency of binge drinking. It has been shown that parents’ lack of knowledge regarding the activities of their child, and lack of monitoring and supervision is related with drinking (Ledoux, Miller, Choquet, and Plant, 2002). Engels, van der Vorst, Dekovic, and Meeus (2007) showed that parents were better in estimating the drinking behavior of their child when they provided rules and control for the drinking related behavior. Adolescents who respect their parents often hinge their decision concerning alcohol usage on the opinion of them (Bowerman, and Bahr, 1973).

The authors of the Twente model of binge drinking assumed that the activities adolescents engage in can, too, be related to binge drinking. Engagement in few structured leisure activities is related to poorer psychological wellbeing and substance use (Trainor, Delfabbro, Anderson, and Winefield, 2009). Also, they assume that visiting so-called ‘keten’ is associated with binge drinking. These are places where adolescents meet, but it is not really comparable to a youth centre, rather to a squat.

Several studies showed that personality is related with substance use. According to Arnett (1996) to reckless behavior, that is, for example, drug use or driving while being intoxicated, is most strongly associated with sensation seeking. This personality trait characterizes the extent a person’s desire for novel, intense and stimulating experiences

(Zuckermann, 2006). Kuntsche, Knibbe, Gmel, and Engels (2006), too, found that sensation seeking is a notably strong predictor of drinking among young people. Woicik, Stewart, Pihl, & Conrod (2009) identified three additional personality traits that can predict binge drinking: Hopelessness/introversion, anxiety sensitivity and impulsiveness. The latter is assumed to function similarly to sensation seeking. It is presumed that an impulsive person (as a sensation seeking person) has problems to control drinking when being in an arousing situation. Impulsive individuals typically do not weight their actions. Anxiety sensitivity is the tendency to fear anxiety-related bodily sensations and to overinterpret them. Anxiety sensitive individuals tend to binge drink for coping reasons. The same seems to be true for hopeless persons.

According to the authors of the Twente model of binge drinking, cultural influences are possible moderators for the impact of personality on binge drinking. It is also imaginable that certain factors of parenting can mediate this relationship because the personality of a child should have influence on parenting. For example, a highly impulsive child could be causing his parents to provide stricter rules, so that the tendency to binge drink is lower as it would be without these rules.

The first aim of this study is to emphasize the effect of personality traits on problem behavior and to trace the personality factor with the strongest predictive power for binge drinking. Furthermore this study wants to investigate how personality traits can be moderated or mediated by the cultural background, the parenting practices and the adolescents' environment.

Unfortunately, binge drinking is not the only risk-behavior of adolescents about which parents, teachers and experts feel concerned. With the rise of the daily use of Internet and video games the potential of overuse is raising, too. This, in turn, may lead to addiction. Although internet and video game addictions are not (yet) a DSM diagnosis it is doubtlessly a harmful development that can heavily interfere with daily life. Weinstein (2010) found that underlying mechanism that can lead to game addictive behavior are mainly stress coping mechanisms, emotional responses, sensitization and reward. Excessive gaming has negative consequences for the adolescents, such as poorer grades in school, attention problems (Gentile, 2008), aggression (Grüsser, Thalemann, and Griffiths, 2007), or neglecting school, work, sleep and friends (Oggins and Sammis, 2010).

Both, binge drinking and excessive gaming thus seems to be comparable, concerning the possible consequences, but what about the causes? Wan and Chiou (2006) found that motives

for game addictions were emotional coping, because participants felt alone or bored, or the need for excitement. Furthermore, they found that gaming was seen as a leisure activity. It is possible thus, that binge drinkers and addictive gamers have similar motives to engage in ‘their’ problem behavior. People which game to cope with negative feelings possibly have high scores in hopelessness or anxiety sensitivity. People who game for excitement or arousal could be impulsive or sensation seeking personalities. If both, binge drinking and game addiction have similar causes and consequences it might be that they belong to the same construct. Ary, Duncan, Biglan, Metzler, Noell, and Smolkowski (1999) found that a single model can account for different problem behaviors (antisocial behavior, risky sexual behavior, academic failure, and substance use). All problematic behaviors were sufficiently interrelated, so that they formed a problem behavior construct. It is possible that game addiction should be included in this model.

The huge difference on the other hand is that binge drinking is associated with a substance whereas game addictive behavior is not. But recently it has been proven that behavior that is not substance-bound be addictive. Here too, chemical balances in brain such as dopamine balance do change over time when engaging in repetitive behavior (Holden, 2001, 2006).

The second aim of this study is to investigate if the personality traits explaining binge drinking (the SURPS) can also account for the explanation of the possible risk factors of excessive gaming. Furthermore, it will be explored if excessive gaming and binge drinking belong to the same construct, that is, if they influence one another or how they are related anyway. The hypothesized model can be seen in Figure 1.

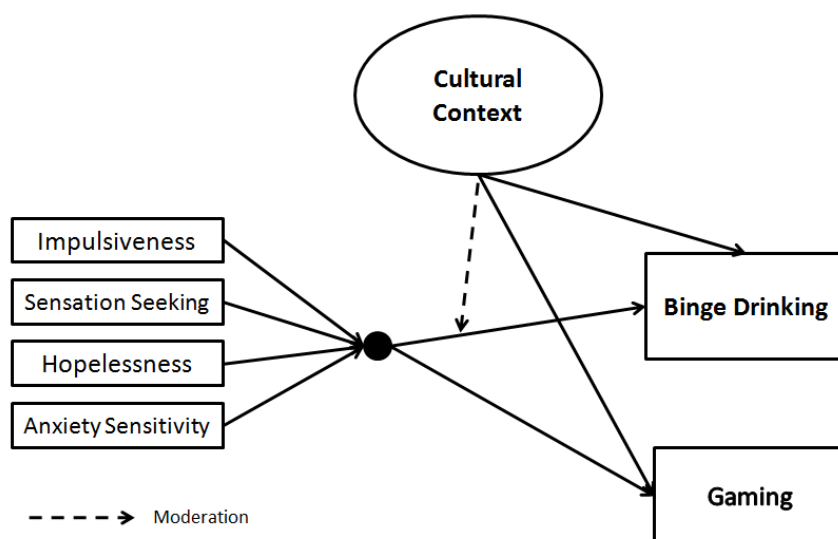


Figure 1

2 Methods

2.1 Participants

Hundred-sixty female and seventy-seven male Dutch-speaking adolescents between 16 and 20 years filled in the survey. Participants were Dutch-speaking German or Dutch students and pupils of secondary schools in Germany and the Netherlands. They were recruited via email, via flyers, that have been spread in schools, at the University of Twente, shops and pubs and cafés in Enschede. Posters have been put up in youth centers and sports clubs. Also we corresponded with schools in Enschede and in the proximity. With these different forms of recruitment we wanted to make sure to have as many socioeconomic status levels as possible included in research. All participants received a reward of a ten Euro gift coupon after successful completion of the survey.

2.2 Instruments

The survey had two similar versions, one online-version and one paper-version. The survey contained 27 questions with in sum 93 sub questions. The main process time was 18 minutes. It included questions about demographics, alcohol use, personality traits, drinking locations, parenting, activities and excessive gaming. The informed consent was the first page of the survey.

2.2.1 Demographic variables

Participants were asked to mention their gender, their age, housing situation, current activity, and highest education. All questions, except for the age-question (which was open) were multiple choice questions.

2.2.2 Alcohol use

This section of the survey began with a short introduction of the term ‘standard unit of alcohol’. Typical examples of such units are presented in pictures. The participants see a wine glass (as one unit), a bottle of beer (as one and a half units), a glass of beer (one unit) and a shot glass (as $\frac{1}{3}$ unit). Furthermore, they saw a table with the ten most common drinking units converted in ‘standard units’.

Lifetime prevalence

The first question of this section was if the participant has ever drunk alcohol in his life. It was a multiple choice question.

Average weekly weekday consumption and average weekly weekend consumption

These constructs were calculated through two answers respectively. For the total weekly consumptions participants reported how many days of the week they drink. The second question asked the average number of standard units the participant drinks on such a weekday. The total amount was calculated by multiplying the number of weekdays a participant drinks by the number of standard units per day. The same was done for the average weekly weekend consumption.

Frequency of monthly binge drinking

The participants reported how often during the last four weeks they drank six or more standard units of alcohol on one occasion.

Frequency of monthly heavy binge drinking

Heavy binge drinking was here defined as drinking ten or more units of alcohol on one occasion. The question for this variable was concerned with the frequency of which this happened to the participants during the last four weeks.

The questions about alcohol use were partly taken from Monshouwer, Verdurmen, van Dorsselaer, Smit, Gorter, and Vollebergh (2007), who conducted a study about risk behavior in the Netherlands. The questions about the average weekly weekday and weekend consumption were added by the investigators of this study.

2.2.3 Personality traits

The following part of the survey included questions about the personality traits. The scale used for this purpose is the ‘substance use risk profile scale’ (2000). The personality dimensions introversion/hopelessness (H), sensation seeking (SS), anxiety sensitivity (AS) and impulsivity were suggested as four distinct possible risk personality traits. Examples of H-items are ‘I am content’ or ‘I feel proud for my accomplishments’. The introversion/hopelessness scale had seven items; the reliability analysis of this study produced a Cronbach’s $\alpha=0.82$ ($M=12.1$, $SD=3.2$).

For measuring the participants amount of sensation seeking, we used six items with $\alpha=0.69$ ($M=15.2$, $SD=3.4$). This personality dimension shows a person’s need for sensitization or thrill. Examples of highly sensation seeking statements were ‘I would like to skydive’ or ‘I am interested in experience for its own sake even if it is illegal’.

The third risk personality trait was anxiety sensitivity. A person that is highly anxiety sensitive is for example scared of unusual body sensations or heart beat changes. Examples of

the overall five items were ‘It’s frightening to feel dizzy or faint’ or ‘I get scared when I’m too nervous’. Reliability analysis produced $\alpha=0.64$ ($M=11.4$, $SD=2.5$).

Highly impulsive persons usually do not think about the consequences of their behavior. This subscale involved six items in its usual form, but we deleted item 5 (‘I would enjoy hiking long distances in wild and uninhabited territory’) of this IMP scale in favor of a better Cronbach’s α . This adjusted scale still had a low reliability with $\alpha=0.61$ ($M=11.1$, $SD=2.2$). An example of a statement of an impulsive person was ‘I usually act without stopping to think’.

2.2.4 Parenting

Four parenting scales were used in this survey.

Parental respect

This 5-point scale (‘strongly disagree’ to ‘strongly agree’) was taken from the research of Bowerman and Bahr (1973). It measured the respect in the parent-child relationship that the child gives due to his or her parents. Exemplary items were ‘it is important to me that my parents approve what I do’ or ‘I respect the opinion of my parents about most important things in life’. The internal reliability was high with $\alpha=0.80$ ($M=20.7$, $SD=3.8$).

Rules

This scale was supposed to measure the rules the participant perceives concerning alcohol provided by the parents. It included ten items with a 5-point dimension and is created by Engels et al. (2005). If participants do not live with their parents anymore they were asked to fill this scale in as if they perceived the rules when they lived in their parents’ house. It was asked if and how much they are allowed to drink at home if, parents are present or absent, respectively. Furthermore, the adolescents reported if they may become half-drunk when being with friends, when coming home and if they are allowed to drink alcohol in general. Reliability analysis for this scale resulted in a highly reliable scale with $\alpha=0.94$ ($M=38.1$, $SD=10.1$).

Monitoring

Like the rules-scale, the monitoring questions were developed by Engels et al. (2005). The 5-point response categories ranged from ‘never’ to ‘always’. The questions were concerned with the behavioral control on the part of the parents regarding the alcohol usage of the child.

Participants who do not (yet) go out or drink alcohol were asked to fill the scale in as if they think their parents would behave. Again, participants that already moved out were asked to answer as if they would still live with their parents. Examples of monitoring of parents were asking their children where and with whom they drink or trying to know if their child's friends drink alcohol. Also, participants were asked to report if they need the permission to drink during week or at weekend. Reliability analysis revealed a relatively low reliability with $\alpha=0.70$ ($M=5.9$, $SD=4.2$).

Quality of communication

The last parenting practice that we assumed to have influence on a persons' risk behavior was the quality communication. We used a six item scale with five response categories (range from 'strongly disagree' to 'strongly agree'), developed by Ennett, Baumann, Foshee, Permberton, and Hicks (2001). This scale measured the openness of the communication between parents and child when making alcohol a subject of discussion. It was about being able to talk to each other easily, honestly, seriously and respectfully. The internal reliability of this scale was high with $\alpha=0.85$ ($M=21.4$, $SD=4.7$).

2.2.5 Environment

Leisure activities

Because we expected an influence of the activities of adolescents to be a possible factor for risky drinking behavior, we included a four item scale about the leisure activities. The original scale is from Beatty, Joen, Albaum, and Murphy (1994), but we shortened the scale in favor of a shorter survey. The leisure activities were narrowed to the underlying constructs. Four categories of activities were mentioned: aesthetic-intellectual (as reading, playing an instrument, crafting, etc.), sports-action (e.g. football, hockey etc.), social-entertainment (like going out, cinema, being member in a club), and at home activities (e.g. watching television, playing video games, Internet). The seven response categories ranged from 'daily' to 'yearly'. We also added a question about the so-called 'keten'. This question asked how often the participant visits such a 'keet'. Responses ranged from 'never' to 'every day'.

2.2.6 Gaming

The last scale of the survey was the Game Addiction Scale from Lemmens, Valkenburg, and Peter (2009). This scale has two possible versions. We chose for the 7-item version over the 21-item version in favor of the process time of the whole survey. This shorter version tested

the seven criteria for addictive gaming: salience ('Did you think about playing a game all day long?'), tolerance ('Did you spend increasing amounts of time on games?'), mood modification ('Did you play to forget about real life?'), relapse ('Have others unsuccessfully tried to reduce your game use?'), withdrawal ('Have you ever felt bad when unable to play?'), conflict ('Did you ever have fight with others over your time spent on games?') and problems ('Have you ever neglected other important activities to play games?') during the last six months. Possible responses were 'never', 'rarely', 'sometimes', 'often' and 'very often'. This study used the continuous values of this scale instead of a cut-off point. The reliability analysis of this scale in our study displayed a highly reliable scale with $\alpha=0.86$ ($M=9.3$, $SD=3.8$).

2.3 Procedure

The hyperlink of the online-survey was sent with the solicitation-emails, so that participants could fill in the survey whenever they wished to. Further, the flyers and posters included an email address so that those interested in the study could email us to get the appropriate hyperlink to the online-survey. The paper versions were left in corresponding schools so that pupils filled them in within the mentor-lessons. Mentors collected and kept them afterwards until we picked them up. Participants were informed about the content of the survey at the beginning of the survey. They also got contact information about the researcher if questions arose. At the end of the survey participants were asked to leave their email address to get the reward at the end of the study. They were informed that their personal data are used only for supplying the reward.

To improve privacy and motivation, participants were assured that their data will be analyzed anonymously and only by the researchers. The whole study was ethically approved by the Ethics Committee of the University of Twente.

2.4 Data analysis

Responses to the survey were screened for missing data. Twenty-one cases were excluded because of having not responded to 20% or more of the questions or obviously not filling in the survey sincerely. Missing values were replaced by mean scores of the respective item. The data was then analyzed with SPSS 16.0.

3 Results

From the 201 participants, 32.2% are male and 67.7% are female. The mean age is 17.9 (sd=1.3). 68.2% live with their parents, 31.8% live alone or in living communities. 46.3% of our participants are pupils and 50.7% are students. The remaining 3% are unemployed. We consider a rather highly educated sample. 2.5% are low educated, 14.9% are following mediocre education programs, and 82.6% are very highly educated (university and VWO-level).

From the whole sample 95% have drunk alcohol at least once in their life. The adolescents drink significantly more ($t=7.46$, $p>0.001$) during weekend (average weekly weekend consumption: $m=2.2$ $SD=4.7$) than during the week (average weekly weekend consumption: $m=7.5$, $SD=8.9$).

56.2% (76.9% of the boys and 46.3% of the girls) at least once drank six units or more at one occasion, during the last four weeks. 17.9% of the whole sample binge drank once, 7% twice, 8% three times, 10% four times, 4.5% five times, 2% six times, 2.5% seven times, 0.5% eight times, and 4% of the sample binge drank nine times during the last four weeks.

For heavy binge drinking, thus drinking ten units or more at one point, percentages are lower: 32.8% (60% of all boys and 19.9% of all girls) engaged in heavy binge drinking in the last four weeks. 12.4% of all participants engaged in heavy binge drinking once, 8.5% twice, 4.5% three times, 0.5% four times, 2% five and six times, respectively, 1.5% seven times, and 1.5% nine times.

3.1 The relationship between personality traits and binge drinking

All of the four personality dimensions correlate significantly with binge drinking and heavy binge drinking. The correlation of hopelessness/introversion with binge drinking ($p=0.009$) and heavy binge drinking ($p=0.007$) is negative, indicating that the greater hopelessness/introversion the lesser binge drinking occurs. A similar pattern is found for anxiety sensitivity. Here, too, correlations for binge drinking ($p=0.002$) as well as heavy binge drinking ($p=0.007$) are negative. Positive relationships can be found between sensation seeking and binge drinking ($p=0.001$) and heavy binge drinking ($p=0.001$). Thus, adolescents scoring high in this personality trait tend to binge drink more often than adolescents scoring low in sensation seeking. The same is true for impulsiveness (for a summary see table 1).

A regression analysis shows that the personality trait that explains most of the variance is sensation seeking (10.3% for binge drinking, 7.7% of heavy binge drinking), but

impulsiveness, too, is accountable for a relatively high part (8.3% and 6.6%, respectively) of the variance. One can see that correlations of binge drinking and heavy binge drinking are comparable, so that further analysis is carried out only for binge drinking, thus drinking six or more units at one occasion. The variance of binge drinking that can be explained by all four personality traits together is 20.4%.

Table 1 – Correlations Personality trait and (heavy) binge drinking

	n	r	p
<i>Binge Drinking</i>			
Hopelessness	200	-0.19	.009
Anxiety Sensitivity	201	-0.22	.002
Sensation Seeking	201	0.32	.001
Impulsiveness	200	0.29	.001
<i>Heavy Binge Drinking</i>			
Hopelessness	200	-0.19	.007
Anxiety Sensitivity	201	-0.19	.007
Sensation Seeking	201	0.28	.001
Impulsiveness	201	0.26	.001

All correlations are significant at the 0.01 level (2-tailed)

3.2 The moderating/mediating effect of cultural variables on the relationship of personality traits on binge drinking

Five aspects of culture are associated with binge drinking (see Table 2). The respect adolescents have towards their parents seems to influence the child's drinking behavior. The more respect the child has, the less it binge drinks ($p=0.023$). The rules that parents provide also have effect on their child's drinking pattern. The more or the stricter the rules concerning alcohol are, the less the adolescent engages in binge drinking ($p=0.001$). Monitoring and communication are not significantly associated with binge drinking. Two of the four leisure activities are associated with binge drinking of adolescents. The first is aesthetic-intellectual ($p=0.027$). This means the more a person is concerned with e.g. reading, playing an instrument or playing chess the less he or she tends to binge drink. But,

the more an adolescents is busy with social-entertainment activities (going out, going to cinema, being member in a club), the more he or she is tending to drink alcohol ($p=0.001$). Going to a 'keet' is also positively correlated with binge drinking ($p=0.005$). A regression analysis shows that the variance of binge drinking explained by those five cultural factors taken together is 22.4%.

A stepwise regression analysis is made for the personality traits and the culture variables for first mediation analyses (see Table 3). The social-entertainment activities seem to be the strongest predictor in model 2 ($\beta=0.2$). All of the four personality traits are mediated by one or more of the cultural factors, because all β -values are lower in model 2 than in model 1. As a matter of fact, sensation seeking is apparently completely mediated ($\beta=0.11$, $p=0.128$ in model 2).

Moderation analyses are made for the five cultural aspects and the four personality traits. Further Mediation analyses are carried out for 'rules' and 'respect', because it was assumed that personality can also affect the parenting style, so that the factors 'rules' and 'respect' not only can be moderators, but mediators, too.

No significant mediations, but two moderations within the personality factor hopelessness/introversion are found: The rules that parents provide seem to moderate the relationship between H and binge drinking (Table 4). Figure 1 shows the relationship of hopelessness on binge drinking with the moderator 'rules' included.

Table 2 – Descriptive statistics and correlations of cultural variables

	M	SD	r (binge drinking)	p
Respect	20.7	3.8	-0.29	.023
Rules	38.1	10.1	-0.16	.001
Aesthetic-intellectual activities	4.4	1.5	-0.16	.027
Social-entertainment activities	4.0	1.0	0.37	.001
Going to a 'keet'	0.4	0.9	0.20	.005

Table 3 – Stepwise regression Personality traits – Cultural influences

	Model 1		Model 2	
Predictors	Beta	p	Beta	p
Hopelessness	-0.16	.012	-0.14	.031
Impulsiveness	0.24	.001	0.16	.019
Sensation Seeking	0.19	.008	0.11	.128
Anxiety Sensitivity	-0.20	.003	-0.15	.018
Respect			-0.05	.472
Rules			0.17	.010
Aesthetical-intellectual activities			-0.09	.152
Social-entertainment activities			0.2	.004
Visiting a 'keet'			0.11	.087
Model	R²=0.20		R²=0.31	
	F(4,195)=12.51 .001		F(9,190)=9.32 .001	
			ΔR²=0.10	
			F(5,190)=5.59 .001	

Table 4 – Regression-table Moderations

	1	2
<i>Moderator: 'Rules'</i>		
	β	β
Hopelessness	-0.15	-0.44
Rules	0.27	0.66
Hopelessness*Rules		-0.34
	R ² =0.11	R ² =0.14
<i>Moderator: 'Social-entertainment activities'</i>		
Hopelessness	-0.15	-0.17
Social-entertainment activities	0.35	0.37
Hopelessness*Soc.-ent. activities		-0.19
	R ² =0.16	R ² =0.19

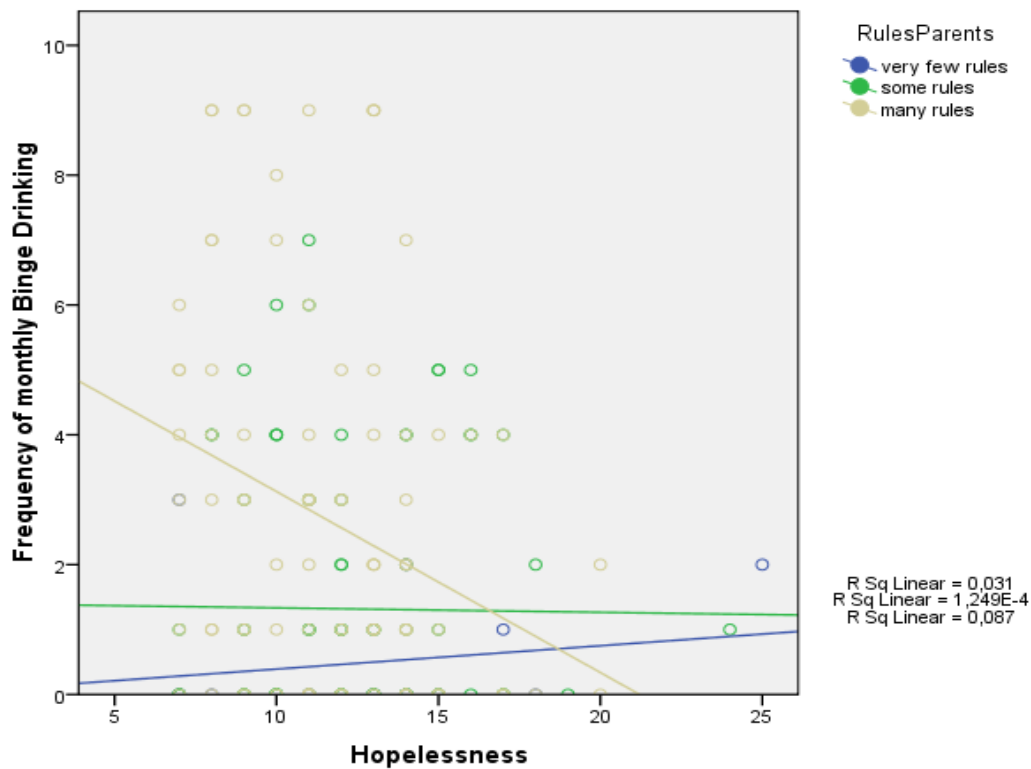


Figure 1

When hopelessness is low, clear differences are found on binge drinking between adolescents with many alcohol-related rules provided by their parents. When hopelessness is high, no differences are found. Rules are effective among low scorers on hopelessness only.

Another moderator is social-entertainment activities (Table 4). Figure 2 shows the how these activities moderate the relationship between hopelessness/introversion and binge drinking.

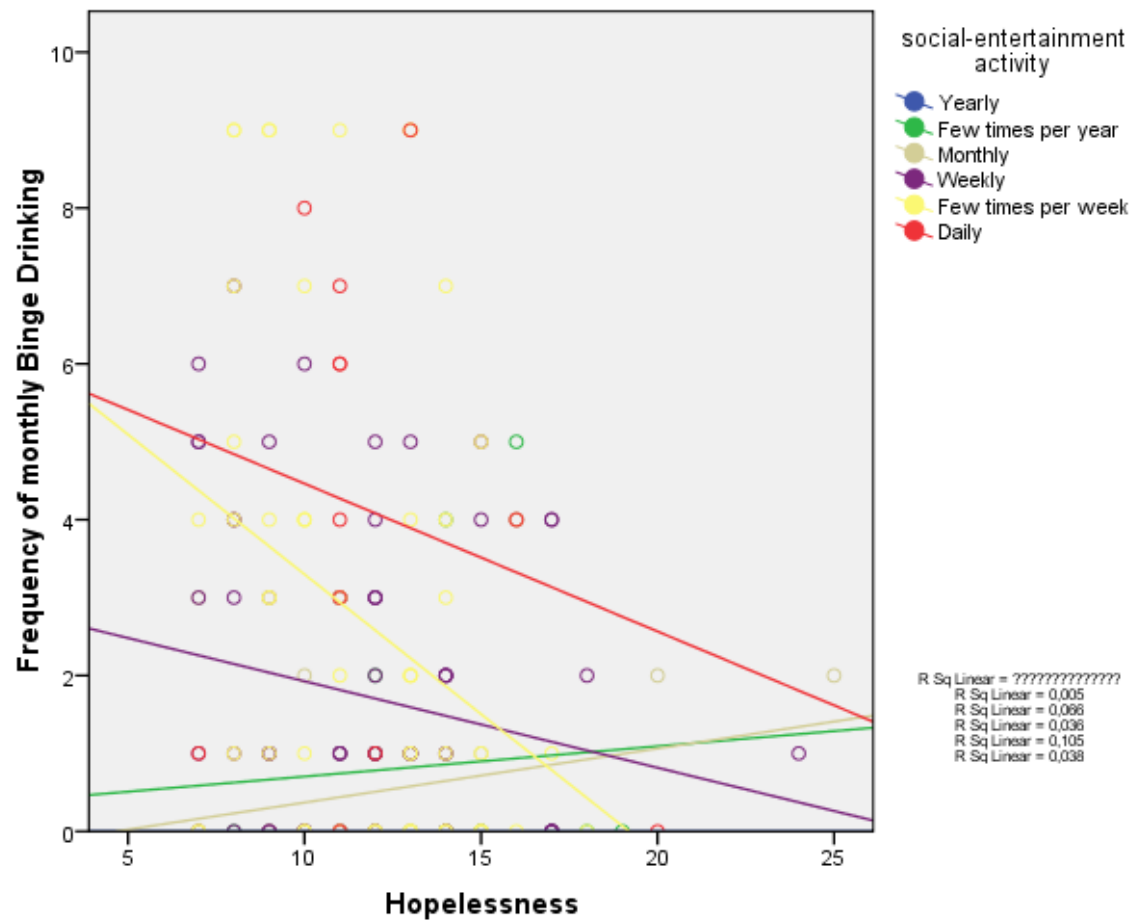


Figure 2

Here, the pattern is similar to this in figure 1. If hopelessness/introversion is high, no effects of engaging in social-entertainment activities on binge drinking are found. However, if adolescents score low on hopelessness, clear differences are found. With low hopelessness/introversion scores, adolescents engaging frequently in social-entertainment activities binge drink more often, than low scoring hopelessness adolescents engaging these activities rarely.

3.3 Personality traits and gaming

The mean score of the continuous game addiction score is 9.3 (8.3 for girls and 11.5 for boys). Sensation seeking and anxiety sensitivity is not significantly associated with gaming. Remarkably, hopelessness/introversion ($r=0.18$, $p=0.01$) is positively correlated with gaming, while it is negatively associated with binge drinking. Impulsiveness ($r=0.15$, $p=0.04$) is also positively correlated with gaming.

3.4 The relationship between excessive gaming and binge drinking

To see how (and if ever) excessive gaming and binge drinking are related, different analyses are made. No significant correlations between gaming and binge drinking can be found. Age or gender do not moderate a possible relationship between gaming and binge drinking. The more adolescents engage in sport-action activities, the less they tend to game ($r=-0.14$, $p=0.041$). Games correlates positively with going to a 'keet' ($r=0.24$, $p=0.001$).

4 Discussion

The study's first aim was to investigate possible risk factors of binge drinking. Preventions can then directly target these factors to be more effective. Hopelessness/introversion and anxiety sensitivity were negatively correlated with binge drinking, whereas impulsiveness and sensation seeking were positively related with drinking at least six units of alcohol. Furthermore, it is found that different cultural variables correlate with binge drinking. Parenting practices as providing alcohol-related rules and the respect the adolescent has toward his or her parents protects against binge drinking. Also, environmental influences are related with drinking: engagement in social-entertainment activities (e.g. going out, or being member of a club) is positively related with binge drinking. Aesthetical-intellectual activities however, seem to protect against binge drinking.

The rules concerning alcohol and engaging in social-entertainment activities moderate the relationship of hopelessness/introversion and binge drinking.

The second aim of this study was to work out if game addiction and binge drinking share possible risk factors. This is not exactly the case. It is found that hopelessness/introversion and impulsiveness are positively associated with excessive gaming. Also, we wanted to investigate the possible relation between gaming and drinking. No associations were spotted between both. The results will now be discussed in detail.

4.1 The relationship between personality traits and binge drinking

Binge drinking is correlated with hopelessness/introversion, anxiety sensitivity, impulsiveness and sensation seeking. Adolescents scoring high in hopelessness/introversion and anxiety sensitivity tend to not binge drink, whereas persons scoring high in impulsiveness or sensation seeking have a greater tendency to engage in binge drinking. These relationships are consistently the same for binge drinking and heavy binge drinking, so that it is apparently not necessary to distinguish between both forms of binge drinking.

What has been found out is consistent with other research findings (Schepsis, Desai, Smith, Cavallo, Liss, McFetridge, Potenza, and Krishnan-Sarin, 2008). Binge drinking is positively correlated with impulsiveness and sensation seeking, whereas it is negatively associated with hopelessness/introversion and anxiety sensitivity. Schepsis et al. found that impulsive sensation seeking is positively associated with problem behavior as alcohol use and tobacco use.

A possible explanation is that adolescents know about the possible harmful consequences of alcohol usage and that sensation seeking individuals disregard warnings and advices because of the stimulation they may experience when exceeding limits. For impulsive individuals it is imaginable that they do not think about the consequences and aftereffects of drinking much alcohol at one occasion. If, however, a person is rather anxiety sensitive he or she may be afraid of bodily changes (and thus losing control) caused by the perceived disinhibiting effect of alcohol. Thus, one could say that a high anxiety sensitivity-score is a 'protective' factor against binge drinking. The same seems to be the case for hopelessness/introversion. One should realize, however, that this study is cross-sectional. Other research findings suggest that habitual binge drinking is positively related with hopelessness/introversion and anxiety sensitivity. Binge drinking then functions as a coping mechanism for highly hopeless or anxiety sensitive individuals (Conrod, Mackie, and Castellanos-Ryan, 2011; Ichiyama and Kruse, 1998; Monshouwer et al., 2010). What is the important difference between habitual binge drinking and occasional binge drinking concerning the hopelessness dimension? If one considers the situation where adolescents typically binge drinks, this may bring up possible explanations. Adolescents typically drink when they meet or go out with friends. It is easily conceivable that hopelessness and introverted adolescents do not engage in that kind of social, active activities, so that they do not find themselves into the typical binge drinking situations. However, it should be considered that the correlations of hopelessness/introversion and anxiety sensitivity and binge drinking were weak, so that one has to be cautious about the results and interpretations. Further research is necessary to confirm the hypothesis that habitual binge drinking is positively correlated with hopelessness and anxiety sensitivity, whereas occasional binge drinking is negatively associated with both.

4.2 The moderating/mediating effect of cultural background on the relationship of personality traits on binge drinking

Only two moderations have been found. It seems that parental rules concerning alcohol serve as a moderator between the relationship of hopelessness/introversion and drinking six or more

alcohol units: When hopelessness is low clear differences of the frequency of monthly binge drinking can be found. Few rules are then associated with more binge drinking, whereas some to many rules are related with fewer binge drinking in one month. When hopelessness/introversion is high, however, few binge drinking is found (on average once in a month), regardless of the rules. This finding was not expected. We estimated sensation seeking and impulsiveness to be ‘weakened’ through strict rules, but not hopelessness. It is possible, that highly hopeless and introverted persons are easily influenced by external stimuli (in this case the rules provided by parents), whereas extroverted and confident individuals are not. Here, again, it should be noted that the correlations were rather weak, so that this finding could be due to random error.

The second moderation effect found was that social-entertainment activities influence the relationship between hopelessness/introversion and binge drinking. When scoring high in the hopelessness/introversion dimension, the tendency to binge drink is low, regardless of the frequency of social-entertainment activities the adolescents engage in. When hopelessness/introversion is low, however, the frequency of social-entertainment activities does make a difference. Then, higher frequencies of engagement in these activities are associated with more binge drinking occasions in one month and fewer social entertainment activities are related to fewer binge drinking. These findings do not seem to support the hypothesis that highly hopeless persons are easier influenced by external stimuli, because more frequent engagement in social-entertainment activities is typically associated with more frequent binge drinking. It is imaginable that hopelessness protects against occasional binge drinking regardless of other influences.

Surprisingly, these were the only moderations that could be found. It was actually supposed that the parenting style would have more influence on the personality-based tendency to binge drink. Also mediations were imaginable because the personality of a child could also affect the parenting style, but this, too, was not the case. The question now is, how can this be explained and what are the causes for this pattern? Further investigation is needed to learn more about this.

Personality traits are very stable. Impulsive and sensation seeking individuals could, for example, violate the rules of their parents because of their personality. Hopelessness/introversion is the only personality dimension where moderations have been found, so it is possibly the only personality trait that is not robust towards cultural influences like parenting practices or leisure activities. Nevertheless it should be noted that this sample

was very heterogeneous. Also, the study is cross-sectional. These and other shortcomings are discussed later.

The behavioral control (monitoring) of parents and the communication between parents and child were not related to binge drinking at all. This could be due to different shortcomings of this study that will be discussed later.

4.3 Personality traits and gaming

The third aim of this study was to explore if the SURPS provide possible explanations for (excessive) gaming. It is found that sensation seeking (which was strongest correlated with binge drinking), and anxiety sensitivity were not related with gaming. However, both, hopelessness/introversion and impulsiveness were correlated with gaming. Hopeless/introverted and impulsive adolescents tend to engage in excessive gaming. If those hopeless and introverted people that do not binge drink because they don't feel comfortable in social interactions, it is possible that they rather game. Gaming is taking place at home, alone in the adolescents' room (Williams, Yee, and Caplan, 2008), and is often intended as an escape from real life. Furthermore, introverted individuals have the possibility to get social contacts more easily (Yee, 2006). The explanation of the correlation between impulsiveness and gaming is not that straightforward. It is imaginable that they do not stop gaming, because they don't think about having homework or other important activities to do. The SURPS (substance use risk profile scale) were, as the name implies, validated with substance use. Excessive gaming is not related to a substance, so that further research is necessary to find possible risk personality traits.

4.4 The relationship between excessive gaming and binge drinking

Nearly no relationships between binge drinking and excessive gaming have been found. Excessive gaming and binge drinking are very different problem behaviors. Whereas binge drinkers often drink in groups and social interactions while being out or being with friends, gaming is relatively passive and less frequently related to social interactions. What has been mentioned before is binge drinking's relationship to a substance, that is, alcohol. Gaming however is restricted to sensual input. This study showed that there were only two things they had in common: the relationship with impulsiveness and visiting 'keten'. Because of their huge differences, both problem behaviors do not seem to be comparable. However, these results, too, could result from the shortcomings of the study. It would be interesting to investigate further if gaming and binge drinking belong to the same problem behavior construct, so that prevention and treatment efforts can be adapted.

4.5 Shortcomings and benefits

Our study has several shortcomings that made interpretations difficult. First, our sample included very few heavy drinkers and very heavy gamers. The distribution of drinking and gaming is thus shifted so that internal reliability of the results is rather low. In future research it is important to include more ‘heavy’ cases.

Secondly, highly educated individuals are overrepresented. Problem behavior is typically associated with low socioeconomic status (Fothergill and Ensminger, 2006) and this study underestimates this population. Future research could prevent this problem with less correspondence with highly educating schools. Furthermore, over 50% of our participants said, that they do not live with their parents anymore. This especially affects the scales concerning the parenting. Although participants that don’t live with their parents were asked to answer as if they would do, this of course leads to a greater error variance. It may be advisable to exclude these individuals from the sample to increase reliability and validity. Also it would have been beneficial if a question concerning the country of origin what have been included. The Netherlands and Germany are neighboring countries, but there are still some differences in the laws regarding drinking alcohol in clubs, etc. A great benefit of this study was the presentation of examples of ‘standard units’. It led to a similar idea of the term for all participants, which, in turn, should increase reliability.

The ‘Twente model of binge drinking’ provides a good framework for further investigation of the risk factors of binge drinking. It also implies starting points for the research of other problem behaviors as excessive gaming. Nevertheless the latter needs more investigation for completely understanding the possible risk factors, so that prevention and treatment efforts can be informed.

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