

Binge drinking and the impulsive pathway in a cultural context

Does a relationship exist between cultural context, impulsive pathway and binge drinking ?

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Samenvatting

Vooraf bij jongeren is een overmatige alcoholconsumptie een groot probleem. Ze drinken vaak in een patroon met overmatige consumptie aan bepaalde dagen en onthouding aan andere dagen. Deze patroon wordt binge drinken genoemd. Binge drinken wordt door veel verschillende factoren beïnvloedt. Doel van dit onderzoek is deze factoren te bepalen en hun onderlinge relatie te onderzoeken. Het Twente Model of Binge Drinking biedt hiervoor het theoretisch kader en probeert door verschillende variabelen, zo als de culturele context, informatieverwerking, en persoonlijkheid het gedrag te verklaren. De focus ligt bij dit onderzoek op de culturele context en de impulsieve informatieverwerking omdat cultuur een belangrijke achtergrond variabele vormt en omdat adolescenten meer het impulsieve pad van informatieverwerking gebruiken. Daaruit leidt zich de volgende onderzoeksvraag af: Welke relatie bestaat tussen de culturele context, het impulsieve pad en binge drinken?

De variabele culturele context is opgebouwd uit opvoeding en georganiseerde vrijetijd activiteiten. Opvoeding betekent in dit geval met de relatie tussen jongeren en hun ouders met betrekking tot ouderlijk respect, regels over alcohol gebruik, communicatie en gedragscontrole. Het impulsieve pad bestaat uit de variabelen willingness, prototype favorability en prototype similarity.

De deelnemers (N=210) beantwoorden in een online survey vragen over hun binge drinken, vrijetijds activiteiten, opvoeding, willingness, prototype similarity en prototype favorability. De data laat zien dat de culturele variabelen ten deel invloed hebben op binge drinken. Uit de data van de opvoedingsschalen blijken alleen de ouderlijke regels van invloed te zijn op binge drinken. De verwachting dat georganiseerde activiteiten tot minder binge drinken leiden kon niet met zekerheid worden bevestigd. De relatie tussen culturele context en het impulsieve pad kon worden bewezen, wat een mediatie mogelijk maakt. Deze mediatie bestaat gedeeltelijk voor ouderlijke regels en de ongeorganiseerde vrijetijds activiteit “sociaal-entertainment”.

Verder onderzoek is nodig om de resultaten van deze studie verder te bevestigen en om nieuwe relaties te onderzoeken die uit de data blijken.

Summary

Alcohol consume is a widespread problem especially for adolescents which engage often in the unhealthy binge drinking behavior. The aim of this study is to show through which factors binge drinking is influenced and to examine the relationship of these factors among each other. These questions are guided by the Twente Model of Binge Drinking, which unites very different aspect to explain binge drinking. Among these factors are personality, information processing and cultural context. This study focuses on the cultural context and the impulsive pathway of information processing, because adolescents seem to remain more on the impulsive pathway and culture is a important background variable which may also have influence on the information processing itself. So the research question is : Which relationship exist between cultural context, impulsive pathway and binge drinking? The variable cultural context is build up out parenting and organized leisure activities. Parenting takes a look on the relationship of the adolescent with its parents in terms of parental respect, alcohol-specific rules, communication and parental monitoring.

The impulsive pathway consist of the variables willingness, prototype favorability and prototype similarity

Participants (N=210) had to fill in an online survey to asses their binge drinking, leisure activities, willingness, prototype favorability/similarity and the way their parents behave towards them by the topic alcohol. The data shows that cultural variables have partly influence on binge drinking. Among the parenting variable only parental rules has influence on binge drinking. The expectation that organized activities lead to less binge drinking could not be proven clearly. The relationship between cultural context and impulsive pathway could be proven and thus speaks for the mediation. This mediation exist partial for the cultural variable parental rules and “social-entertainment”, which belongs to the unstructured leisure activities. Further research is needed to prove the findings and examine new relations that are indicated by the current data.

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1. Introduction

Alcohol is one of the few legal drugs in western societies and a social factor as well as an economic factor (Morgan, 1988; Pavis, Cunningham-Burley & Amos, 1997). Alcohol inhibits the central nervous system but is often perceived as excitatory. The perceived effects of the drug depend on the amount of intake. Small amounts of alcohol can lead to loss of inhibitions, talkativeness and dizziness. Greater amounts can cause motor and speech disabilities. So, drunken people often start babbling and have problems with their balance which manifest themselves in ataxia symptoms. In case of an alcohol intoxication, people can lose consciousness and fall into a coma. This state of drunkenness can be life-threatening (Drug guide, n.d.; Alkohol macht kaputt, n.d.).

Even though we know about the harmful consequences of the consumption, a great percentage of people have used it one time or another. In so called “wet countries” a moderate daily intake is common, whereas in “dry countries” the consumption is limited to special times, but then a greater amount is used (Measham, 2006). Besides the culture, other social influences on drinking are for example the behavior of parents and friends. One is more likely to drink when one’s friends and/or parents drink, too (Urberg, Degirmencioglu & Pilgrim, 1997; Hawkins, Catalano & Miller, 1992). However, parents have more indirect influences by the way they raise their child and by communicating values (Van der Vorst, Engels, Meeus & Dekovic, 2006; Barnes, Reifman, Farrell & Dintcheff, 2000). There are also personality traits that can promote drinking. Sensation seekers, for example, need a higher amount of alcohol to feel the same arousal as non-sensation seekers (Magid, MacLean & Colder, 2007). Other personality traits as self-control, anxiety and impulsiveness have impact as well (Comeau, Stewart & Lobe, 2001; Woicik, Stewart, Phil & Conrod, 2009).

To protect the young from the harmful effects of alcohol, most countries use an age limit to restrict intake. However a big part of adolescents starts drinking at a much earlier age often due to the laxly controlled laws (Schippers, 2011). At the age of 12, 50% of the Dutch students have already consumed alcohol and with age 15 the fraction raises to 89% (Monshouwer, Verdurmen, Van Dorsselaer, Smit, Gorter & Vollebergh, 2008). Earlier drinking is linked with greater likelihood for alcohol dependency and alcohol related injury later in life (Jerningan, 2001). It is very common for adolescents to drink alcohol on parties or other social occasions to get drunk and have fun (Pavis et al., 1997; Knutsche, Knibbe, Gmel & Engels, 2005). The drinking pattern of many young people can be described as binge

drinking. Binge drinking is defined by the WHO as: “*A pattern of heavy drinking that occurs in an extended period set aside for the purpose. [...] A binge drinker or bout drinker is one who drinks predominantly in this fashion, often with intervening periods of abstinence.*” (World Health Organization [WHO], n.d.). Wechsler and Nelson (2001) add a description of the amount of alcohol, defined as heavy drinking that is five glasses for men and four for women.

To understand the phenomena of binge drinking, it is of interest to understand why people engage in such behavior although they are aware of the possible harmful consequences. Theories like the “Theory of Planned Behavior” have given us insight in the complicated process of decision making and its determining components (Ajzen, 1991). An intention to engage in some kind of behavior is composed of the attitude towards it, the subjective norm and the perceived behavioral control. Thus, it appears that personal and social factors are important components in decision making. Though we still cannot explain all behavior with this rational model. Although people often have no intention to engage in risky behavior they still engage in this kind of actions. How is this discrepancy to explain? The “Prototype Willingness Model” makes an attempt to answer this question by adding a more irrational and impulsive component to the decision making process. This component is described as the willingness someone has to engage in a behavior, which is not produced through pure logical reasoning but rather through the prototype of the action (Hofmann, Friese & Wiers, 2008).

Therefore it is evident that binge drinking can only be explained completely by considering very different aspects. All the aspects mentioned above interact with each other and produce the binge drinking behavior. The Twente Model of Binge-Drinking, which will be examined in detail now, tries to explain these influences and interactions.

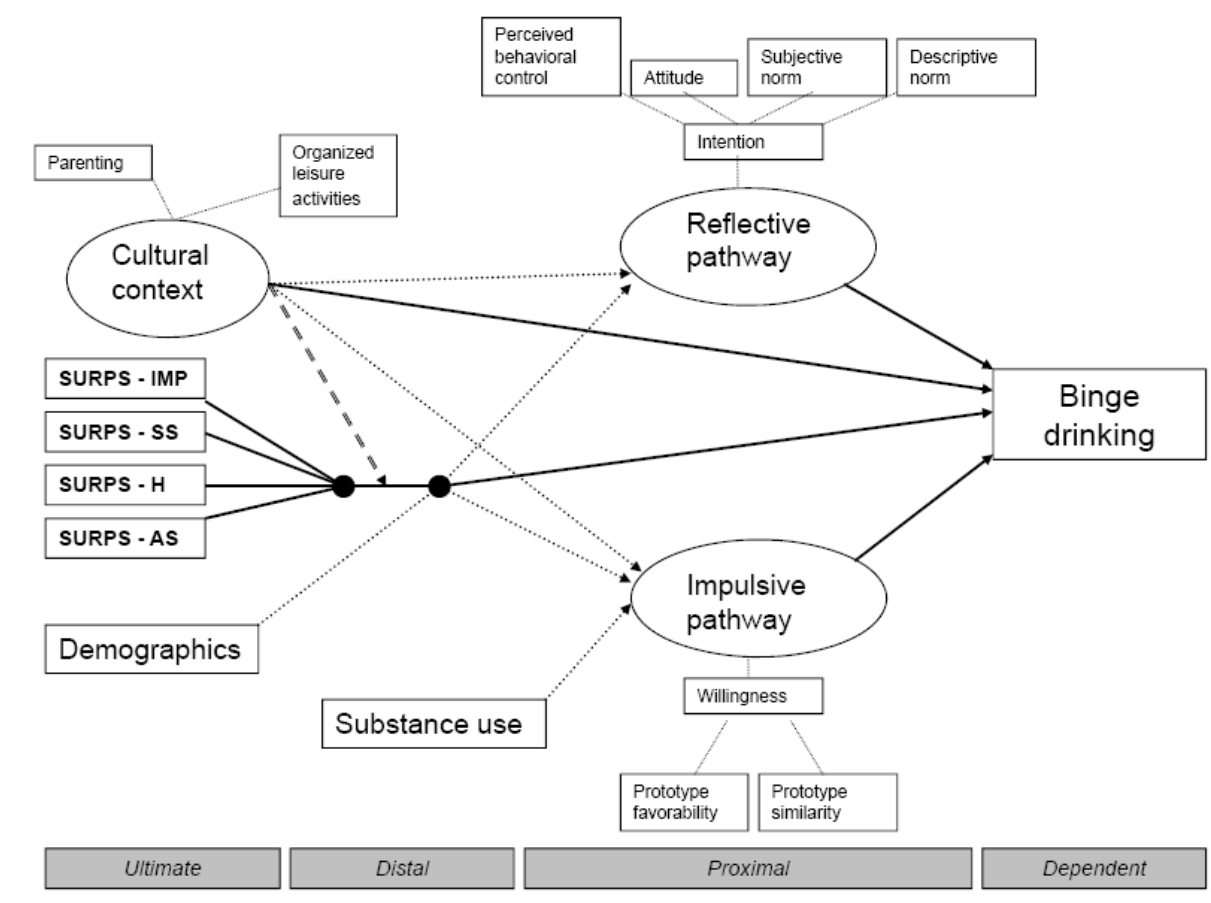
2. Theoretical Background: The Twente Model of Binge-Drinking

The Twente Model of Binge-Drinking combines personality traits, information-processing systems, demographic information and the cultural context to explain binge drinking (see figure 1).

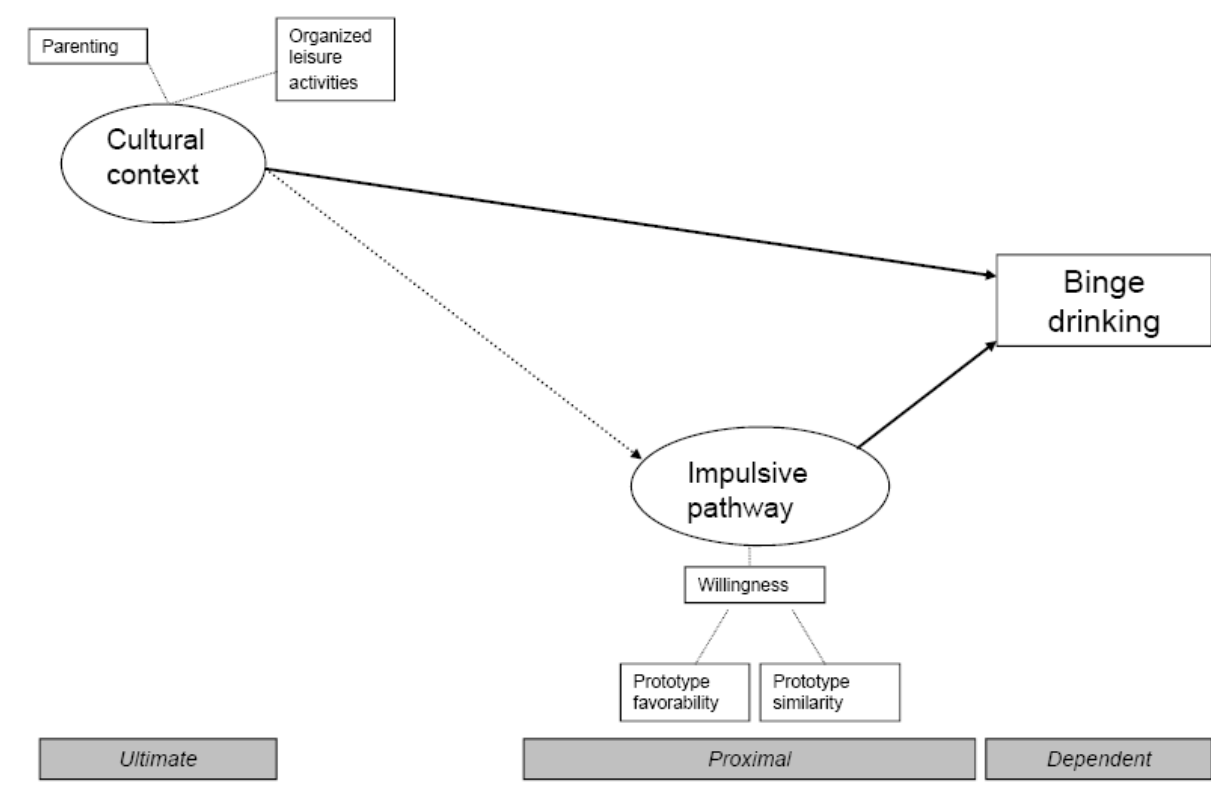
The variables are divided into groups by the kind of influence they have on binge drinking. The proximal determinants are the information processing systems which have a direct influence on the dependent variable binge drinking. The distal determinant is substance use which influences both of the proximal determinants. Personality and cultural context belong to the ultimate variables, which are not easily influenced by the individual and function as a background for the development of long term risks (Petratis, Flay & Miller, 1995). The model assumes that these ultimate determinants have influence on the proximal determinants as well as on the dependent variable binge drinking.

The proximal determinants are made up of the information processing systems. Those systems are conform to the dual system approach. That includes both the reflective, more rational, pathway and the impulsive pathway, which is more affective. Both pathways can have influence on the performance of a behavior by affecting the decision process (Hofman et al., 2008).

The distal determinant substance use describes the consume pattern for other drugs such as nicotine and weed. This pattern can influence the information processing systems and exert indirect influence on binge drinking (Kaplan, Martin & Robbins, 1984). The constructs personality, demographics and cultural context make up the ultimate variables. Sensation seeking, impulsiveness, anxiety sensitivity and hopelessness are the four personality traits that are assumed to play a role in binge drinking. People high in sensation seeking have a strong need for novel and intense experiences what can be related to frequent and excessive alcohol use (Zuckerman, 1994; Urbán, Kökönyei & Demetrovics, 2008). Impulsiveness describes how easy a person acts without thinking of the possible consequences. The fear of anxiety related bodily sensations and the bias to catastrophise this sensation is measured by anxiety sensitivity (Application Testing the Model of Binge Drinking, 2010). People high in this trait are disposed to use alcohol as coping strategy (Comeau et al., 2001). Hopelessness indicates depression-proneness and heightens the possibility to fall in a pattern of problem drinking (Woicik et al., 2009). The term demographics includes sex, age, and level of education. The determinant culture consists of the variables parenting and organized leisure activities. The variable parenting is divided into parental monitoring, alcohol related rules, communication and parental respect. The organized leisure activities are of interest, because unsupervised time can heighten the possibility to engage in the risk behavior (Mahoney & Stattin, 2000).

Figure 1 Twente Model of Binge Drinking (TMBD)

This study will examine in detail the cultural context and the impulsive pathway with relation to binge drinking (see figure 2). This selection is chosen because the cultural context as ultimate variable forms one of the most important risk factors for binge drinking. This is true because it can have direct influence as well as indirect influence via information processing. Parenting is one of the main factors that is formative for many areas in our life (Baumrind, 1991). Therefore, it is not surprising that it also influences the alcohol consume and the information processing systems. From the information processing systems, the impulsive pathway was selected because this study takes a focus on adolescents. These young people still rely more on the impulsive parts of their brain than doe adults (Rooke, Hine & Thorsteinsson, 2008).

Figure 2 Pathways of the Current Study

2.1 Cultural Context

The cultural context consists of the variables parenting and organized leisure activities and belongs to the ultimate variables.

The term parenting describes in which way parents raise their children with differences in the amount of control and support. Those differences can manifest themselves in monitoring, rules, respect and communication. Parental monitoring is the amount to which the parents know where the child is, what it is doing and with whom (Steinberg, Fletcher & Darling, 1994). This can be supported by rules that parents set to protect the child. Parental respect is the way children respect the opinion and values of their parents. Furthermore communication is an important factor in the child-parent relationship. It determines the way in which monitoring, rules and respect are mediated. These different dimensions have great influence on the development of the child in general but also in relation to substance use (Patock-Peckham, Cheong, Balhorn & Nagoshi, 2001). Strict rules for the use of alcohol have influence on the consumption but also communication about these rules seems necessary for a long-term effect (Van der Vorst et al., 2006). So showed Steinberg et al. (1994) that low support and monitoring are linked positively to adolescents substance use but too much of

both can backfire and increase the risk of binge drinking (Guliamo-Ramos, Jaccard, Turrissi & Johannsson, 2005).

Organized leisure activities are the activities beyond the school that are structured in some way, such as team sports or a theater group. Characteristic of this sort of activities is regular participation and meetings, rule-guided engagement, direction by an adult leader, emphasis on skill development and feedback (Mahoney & Stattin, 2000). Young people who have a great amount of monitored activities that are highly structured are less likely to use drugs or perform delinquent behavior. But every youngster participates to some degree in unstructured activities like watching TV or hanging out with friends. During such activities, the opportunity to engage in deviant behavior is greater than during organized activities (Osgood, Wilson, O'Malley, Bachman & Johnston, 1996). So why are such situations only troublesome for some adolescents? The social context of the situation is what makes the difference. Together with deviant peers, unstructured leisure activities provide a perfect background for antisocial behavior. Organized leisure activities often demand a higher level of social engagement, because of the need of peer cooperation, support and guidance (Mahoney & Stattin, 2000). Therefore adolescents that also engage in this activities have a higher social competence and often also a social competent circle of friends (Kurdek & Krile, 1982). In addition, organized leisure activities make it easier for parents to know where the child is, with whom and what it does in its free time, thereby enhancing parental monitoring (Mahoney & Stattin, 2000).

2.2 The Impulsive Pathway

The impulsive pathway is a proximal determinant, with a more direct influence on the behavior. In contrast to the reflective pathway it is rather unconscious and characterized by emotions and attitudes. So, it is possible that especially adolescents rely on this pathway because their frontal lobes, which are responsible for rational decisions, problem solving and impulse control, are not yet developed completely. Instead of relying on the frontal lobes, adolescents use the amygdale, which is known to be responsible for impulses and emotion (Rooke, et al. 2008). That neuropsychological fact is supported by research which showed that up to age 17 or 18 the connection between willingness and substance use is stronger than the connection between intentions and use (Van Empelen & Kok, 2006; Spijkerman, Van den Eijnden & Engels, 2005).

The impulsive pathway is divided in three variables: willingness, prototype favorability and prototype similarity. Those variables originate from the “Prototype Willingness Model” as described by Gibbons and Gerrard (1995).

Willingness is the readiness to perform a certain behavior in a certain situation. For example in a situation where alcohol is available, willingness determines the likeliness to drink it (Gibbons, Gerrard, Blanton & Russell, 1998). “What will you do?” is different from “What do you plan to do?” because willingness is less rational and more reactive than a planned behavior. Thus by high willingness to drink the chance is higher that this behavior will be performed. Willingness is linked with prototype favorability and prototype similarity. A prototype is the image we have about something e.g. about the user of alcohol. Thus prototype favorability describes how favorable an image is and prototype similarity how similar we find ourselves with this image (Gibbons & Gerrard, 1995). The more favorable the picture and the more we think we resemble this picture, the more likely we are to have the willingness to perform the action of the prototype (Gibbons et al., 1998). Thereby, the image of the prototype must not be positive at all. For the majority it is not the goal to acquire the image (Gerrard, Gibbons, Houlihan, Stock & Pomery, 2007). It is more important how acceptable and thus how favorable a prototype and its social consequences are.

Prototypes and through that, also willingness can be shaped by parenting, friends and personality variables such as self-control (Gerrard et al., 2007). The alcohol consumption of peers and parents shape the expectancies adolescents have of drinking. So, for example, they believe that alcohol relaxes people. However, in general peers have more influence on the consumption than parents have, especially when adolescents get older. Then peers influence life style choices (being a smoker or drinker) but parents influence remains on values and cognitions. (Oulette, Gerrard, Gibbons & Reis-Bergan, 1999). Effective parenting is linked with less prototype favorability and this in turn is connected to less willingness to perform the behavior (Cleveland, Gibbons, Brody, Gerrard & Pomery, 2005)

3. Hypotheses

As said above, this thesis focuses on the part of the Twente Model of Binge Drinking as shown in figure 2. Therefore the following research questions will be examined.

Does a relationship exist between cultural context and binge drinking?

It is expected that unstructured leisure activities are positively linked to binge drinking, whereas organized activities should be negatively linked to binge drinking. High parental respect, strict rules, good communication and high monitoring should be negative linked to the problem behavior.

Does a relationship exist between impulsive pathway and binge drinking?

It is expected that willingness will be influenced through prototype similarity and favorability. High similarity and favorability for the prototype will lead to high willingness and this in turn will lead to more binge drinking. The opposite is true for low willingness.

Does a relationship exist between cultural context and impulsive pathway?

It is expected that the cultural variables have influence on willingness and thus also indirect on the prototype favorability and similarity. High scores in the parenting scales will lead to less willingness to drink, the same is true for a great amount of organized leisure activities.

Does the impulsive pathway mediate the relationship between cultural context and binge drinking?

It is expected that such a mediation exists and that thus cultural context has only an indirect influence through impulsive pathway.

4. Methods

4.1 Procedure

In this cross-sectional study respondents were gained for the measurement via flyers that were distributed over youth centers, schools/universities, sport teams, stores, cafes and restaurants.

In addition, the target group was directly approached in the town center of Enschede. Promotion of the study took also place via the internet. On social platforms as Facebook and Hyves the links were shared. Also e-mails were used.

At the beginning of the survey, participants got information about the study and the procedure. They were informed that the aim of the study was to assess habits related to alcohol and it was alluded that more information would be available after the interpretation of data. After this, participants gave their informed consent. It was assured that everything would be anonymous and that all issues concerning the person would be destroyed at the end of the research.

After completing the survey, the participants were rewarded with a gift coupon of 10 euro.

4.2 Measures

Most of the data was collected via an online survey, only a smaller amount of data was collected with the paper and pencil version of the online survey. Data collection for this study took place as a part of a collaborative project, where also other relevant data for the topic binge drinking was gathered. The survey contained in total 43 questions that belong to 10 constructs, whereas 4 constructs are relevant for this paper.

4.3 Demographics

Firstly some demographic data was collected, that contained the sex, age, kind of residence, education and current main occupation. Those data was measured by multiple-choice questions and one open question for age.

4. 4 Alcohol Related Questions

First of all participants were asked if they ever had drunken alcohol to asses the life time prevalence. By measuring the alcohol consumption the questions were obtained from Monshouwer, Verdurmen, Vn Dorsselaer, Smit, Groter & Vollebergh (2007). It is assumed that when a drink is served in the appropriate glass (e. g. wine in a wine glass) that every glass contains a similar amount of alcohol. This explanation was also given in the beginning of the

survey, together with example pictures of norm glasses and a list that stated the number of glasses for common drinks.

Next the regularity of drinking within the week and on weekends was assessed with two multiple-choice questions. In addition the amount in glasses was measured, also split in week and weekend consume. Furthermore, participants were asked with two further multiple-choice questions how often they engage in extreme alcohol consume. That means how often they drink more than six or more than ten glasses.

4.5 Impulsive Pathway

The impulsive pathway components were measured each with a 5 point Likert scale. The items are originated from Korte, Pieterse, Postel and Hoof (2011).

The first question assessed the prototype favorability of an alcohol user, for this the attitudes towards someone of the same age who drinks more than six glasses within one week was questioned. Participants had to rate how cool, interesting, handsome/pretty, popular and brave someone like this is and if he has many friends, can get many girls/boys and engages often in sexual activities. Ratings could range from not at all (1) to very much (5). Reliability for this scale is high with an alpha of 0.94.

With the next question prototype similarity was measured. The participants were asked to which amount they resemble such a person. Possible answers ranged from not at all (1) to very much (5).

Willingness was predicted with the third question, that assumed a situation where the participant already drank at least six glasses and is then offered another drink by a friend. Three possible reactions were given (drink the drink, take the drink but do not drink it and refuse to take the drink) and participants had to state how likely it would be for them to perform each of the actions. With an alpha of 0.63 this scale has only a moderate reliability.

4.6 Culture

To determine the variable parenting, different scales were used.

The first scale from Bowerman and Bahr (1973), with six items, was related to parental respect. A high score indicated high parental respect. Ratings could be given with a 5 point

Likert scale, ranging from not at all (1) to very much (5). An example item is: “It is important that my parents value what I do”. A good reliability of 0.79 could be found within the scale.

Another scale was the ten item long alcohol specific rules scale that is developed by Van der Vorst, Engels, Meeus, Dekovic’and Van Leeuwe (2005). This scale measures the degree to which parents permit their child to drink alcohol in different situation (at home, with friends, etc.) from the viewpoint of the child. The statements are rated by a 5 point Likert scale, ranging from completely applicable (1) to not applicable at all (5). Higher scores indicate strict rules about alcohol consume (Van der Vorst et al., 2005). The internal consistency is high with $\alpha = 0.94$.

Additionally, a ten item long scale from Engels, Finkenbauer, Kerr and Stattin (2005) concerning alcohol specific parental control was used. The amount of parental control is measured from the viewpoint of the child with a 5 point Likert scale. An example item is: “Before you leave home on Saturday evening do your parents want to know with whom and where you drink?” A high score indicates a great amount of parental monitoring. The reliability is modest with $\alpha = 0.70$.

Also, the frequency of alcohol related communication was measured with a six item long, 5 point Likert scale (Spijkerman, Van den Eijnden & Huiberts, 2008)

The items asked for the interest of communication about alcohol, the perceived strain during such communications, the amount of perceived respect and honesty. A high score speaks for ease and satisfactory communication. With an alpha of 0.84 the scale is reliable.

To find out about the organized leisure activities of the participant, a modified version of the leisure activity scale from Beatty, Jeon, Alabaum and Murphy (1994) was used. The constructs from the original scale were used to make a shorter version. Leisure activities were sorted in 4 different categories: “aesthetic- intellectual” (e.g. reading, to make music), “sport-action” (e.g. soccer), “social-entertainment” (e.g. going to the cinema or party) and “at home” (e.g. watching TV, playing video games). For each category the participants had to rate how often they engage in this kind of activities, thereby answers ranged from daily to annual. The reliability of this multiple-choice question is very low with an alpha of only 0.31.

4.7 Data Analyses

After the cleaning of the data, reliability and descriptives are assessed for all scales and constructs. Next correlation analyses will be used to get an overview over connections between the variables. Depending on those relations, further analyses will be executed. To these extended analyses belong regression analyses to assess the main influences on variables and to control for a possible mediation.

5. Results

5.1 Participants

The target group consists of adolescents between 15 and 21 years old. The mean age was 18 and from the original 222 surveys, 12 surveys were excluded because of more than 20% missing values or age limit. Of the remaining participants 68% were female and 32% were male. All of the participants were Dutch-speaking. At the moment of the study, from 97 % that were enrolled in a kind of secondary education 51% were university students and 45% were pupils, mostly, on VWO level (41 %). Most participants (67%) were living alone or in a flat share whereas 45% were living together with their parents.

5.1.1 Drinking Habits

From all participants 12 (6%) stated that they never had drunken alcohol during their lifetime. From the drinking majority 40 % do not consume alcohol during the week or only less than one day (25%). If they drink during the week then only between one (17%) and two (13%) glasses ($m=1,6$). On weekends amounts and frequency of alcohol consumption are visibly heightened. 33% of the participants drink on one day during the weekend and 28 % drink on two days. The mean of consumed glasses during one weekend evening is five. A great part (45 %) of the participants had not drunken more than six glasses a night during the last four weeks but 18% had at least once drunk more ($m=1,8$). More than the half (69%) had in the last four weeks not drunk more than ten glasses which is reflected in the mean of 0,9.

Due to good correlations with the constructs and best fit with the definition of binge drinking the question “How often did you drink 6 or more glasses during the last four weeks?” was chosen as a measure for binge drinking.

Considering the correlation of the binge drinking variable, especially the relation with willingness is strong ($r=0,566^{**}$). Another connection to one of the variables from the impulsive pathway could be found for prototype similarity ($r=0,355^{**}$). Among the parenting scales only negative and less strong relations could be found (see table 1). One further moderate relation was with the leisure activity “social-entertainment” ($r=0,365^*$).

5.1.2 Relationship with Parents

The scale parental respect had a mean of 3,5 ($s=3,7$), indicating a general respectful attitude toward the parents. The parental rules were only moderate strict with a mean of 2,2 ($s=1,0$). Monitoring of the child’s behavior was perceived as relative low with a mean of 2,1 ($s=0,4$). In contrast, the communication about alcohol with the parents was good with a mean of 3,6 ($s=0,8$).

5.1.3 Organized Leisure Activities

The most popular leisure activity was “at home” with 70% engaging daily in this activity. Between the other activities were no such explicit trends. “Aesthetic-intellectual” activities were performed daily from 32% of the sample. 40% engaged a few times in a week in “sport-action” activities and 40% of the adolescents engaged weekly in “social-entertainment activities”.

“Social-entertainment” had a positive correlation with willingness ($r=0,250^{**}$), binge drinking ($r=0,365^{**}$) and with “sport-action” ($r=0,256^{**}$). Also it had a negative relation with parental rules ($r=-0,303^*$) (see also table 1).

5.1.4 Impulsive Pathway

The question about prototype favorability was mostly answered with “not at all” ($m=1,9$ $s=1,0$), so was the question about prototype similarity ($m=1,7$ $s=0,9$). Willingness had a mean

of 3,3 ($s=0,9$). 12% of the participants would surely take the drink and drink it, 28% would take the drink but do not drink it and only 9% would not take the drink.

Willingness could be connected to the cultural variables “social-entertainment” ($r=0,250^{**}$), “at home” ($r=0,178^*$), parental respect ($r=-0,243^{**}$), parental rules ($r=-0,206^{**}$) and parental communication ($r=-0,184^{**}$). Furthermore, relationships could be established to prototype favorability ($r=0,175^*$) and prototype similarity ($r=0,392^{**}$). Prototype similarity had also a relation to prototype favorability ($r=0,381^{**}$) and to binge drinking ($r=0,335^{**}$) (see also table 1).

5.2 Which Relationship Exists between Cultural Context and Binge Drinking?

To get an overview about the relation between cultural context and binge drinking correlations were calculated. Parental respect ($r=-0,156^{**}$) and parental rules ($r=-0,288^{**}$) were the only scales from the parenting scales, that had a significant relationship with the binge drinking variable. Two constructs of the leisure activities had a significant relation too (see table 1). This were “aesthetic-intellectual” ($r=-0,158^{**}$) and “social-entertainment” ($r=0,365^{**}$).

Next, regression analyses were conducted to examine the relationship more detailed. First, the influence of the correlating leisure activities, “aesthetic-intellectual” and “social-entertainment”, on binge drinking was assessed. Separately these variables can explain 17% of the variety in binge drinking. It was found that “aesthetic-intellectual” ($\beta=-0,195$; $p=0.003$) and “social-entertainment” ($\beta=0,383$; $p<.000$) had a significant forecast power, as expected from the correlations. Then the parenting scales respect and rules were examined on their forecast power for binge drinking. 10% of the variety could be explained by them and only parental rules were found to be significant ($\beta=-0,275$; $p<.000$).

Thus the hypothesis that organized activities have a negative relationship to binge drinking whereas unstructured activities have a positive relation could partly be confirmed. Also the hypothesis that high parental rules are negatively linked to binge drinking was found to be true. For the other parenting scales no relation could be found.

5.3 Which Relationship Exists between Impulsive Pathway and Binge Drinking?

First, the correlation between the variables of the impulsive pathway and binge drinking were explored. Prototype similarity ($r=0,335^{**}$) and willingness ($r=0,566^{**}$) were found to have a significant correlation with binge drinking whereas prototype favorability was not significant (see table 1).

Then a regression analyses was conducted to prove the assumption that prototype similarity and prototype favorability influence willingness. It was found that only prototype similarity influences willingness ($\beta=0,381$; $p<.000$). Because of this result and the partly lacking correlations for both prototypes with leisure activities and parenting the variables were excluded for the regression analyses.

Next, a regression analyses with willingness was executed, it can explain 32% of the variety in binge drinking. Thus willingness ($\beta=0,566$; $p<.000$) had a significant influence on the dependent variable.

The hypothesis that high prototype favorability and similarity lead to high willingness was only true for prototype similarity. However willingness had a positive relationship to binge drinking, as expected in the hypothesis.

5.4. Which Relationship Exists between Cultural Context and Impulsive Pathway?

To examine the relationship between the cultural context and the impulsive pathway first a correlation analyses with the belonging variables was executed. These analyses showed that all parenting scales besides parental monitoring had a low but significant negative correlation with willingness (see table 1). Among the leisure activities only “at home” ($r=0,178^{*}$) and “social-entertainment” ($r=0,250^{**}$) had significant relationships.

In the following regression willingness was used as dependent factor and parental communication, respect and rules were used as independent factor. These factors explain 13% of the variety of willingness. Only parental communication ($\beta=-0,250$; $p=0,002$) and rules ($\beta=-0,290$; $p<.000$) were found to be significant.

Next a regression with the leisure activities “at home” and “social-entertainment” as independent factors and willingness as dependent factor was executed. The analyses showed that the variables can explain 8% of the variety in willingness. The activity “at home” had a significant positive influence ($\beta=0,147$; $p=0,029$) as well as “social-entertainment” ($\beta=0,231$; $p=0,001$).

It was expected that high scores in the parental scales would be negatively related to willingness. This could only be proofed to be true for parental communication and parental rules. The hypothesis that unstructured activities have a positive relationship with willingness was confirmed. But the data failed to show the opposite for organized activities.

5.5 Does the Impulsive Pathway Mediate the Relationship between Cultural Context and Binge Drinking?

The performed regression analyses show that there is a relationship between parts of the cultural context (“aesthetic-intellectual”, “social-entertainment” and parental rules) and binge drinking as well as between parts of the impulsive pathway (willingness) and binge drinking. Furthermore a relationship between parts of the cultural context (parental rules, parental communication, “aesthetic-intellectual”, “social-entertainment” and “at home”) and impulsive pathway (willingness) could be shown. With this results the requirements for a possible mediation through the impulsive pathway are available.

Tabel 1 Correlation Matrix

	Binge Drinking	Prototype Similarity	Prototype Favorability	Willingness	Parental Respect	Parental Rules	Parental Monitoring	Parental Communication	At Home	Social-Entertainment	Sport-Action	Aesthetic-Intellectual
Binge Drinking	1,000	0,335**	0,075	0,566**	-0,156*	-0,288**	-0,018	0,017	0,058	0,365**	0,092	-0,158*
Prototype Similarity	0,335**	1,000	0,381**	0,392**	-0,133	0,014	0,131	-0,223**	-0,011	0,139*	0,028	-0,113
Prototype Favorability	0,075	0,381**	1,000	0,175*	-0,133	0,017	0,055	-0,212**	0,017	0,102	0,008	0,074
Willingness	0,566**	0,392**	0,175*	1,000	-0,243**	-0,206**	-0,011	-0,184**	0,178*	0,250**	0,051	-0,123
Parental Respect	-0,156*	-0,133	-0,133	-0,243**	1,000	0,101	0,098	0,381**	-0,062	-0,131	0,021	0,124
Parental Rules	-0,288**	0,014	0,017	-0,206**	0,101	1,000	0,369**	-0,384**	-0,098	-0,303**	-0,056	-0,006
Parental Monitoring	-0,018	0,131	0,055	-0,011	0,098	0,369**	1,000	-0,121	-0,092	-0,061	-0,006	0,125
Parental Communication	0,017	-0,223**	-0,212**	-0,184**	0,381**	-0,384**	-0,121	1,000	0,030	0,015	0,111	0,014
At Home	0,058	-0,011	0,017	0,178**	-0,062	-0,098	-0,092	0,030	1,000	0,132	0,195**	0,007
Social-Entertainment	0,365**	0,139*	0,102	0,250**	-0,131	-0,303**	-0,061	0,015	0,132	1,000	0,256**	0,095
Sport-Action	0,092	0,028	0,008	0,051	0,021	-0,056	-0,006	0,111	0,195*	0,256**	1,000	0,038
Aesthetic-Intellectual	-0,158*	-0,113	0,074	-0,123	0,124	-0,006	0,125	0,014	0,007	0,095	0,038	1,000

Note ** p<0.01 (2-tailed); * p<0.05 (2-tailed)

To explore the mediation the procedure described by Baron and Kenny (1986) was used. In the following regression analyses only cultural variables were used that had a relation with both, binge drinking and willingness. Those variables were “aesthetic-intellectual”, “social-entertainment” and parental rules. First individual regressions with the cultural variables as independent variables and the dependent variable willingness were conducted. Thereby “aesthetic-intellectual” had no longer a significant relation with willingness. Then regressions were conducted with the dependent factor binge drinking and the independent variables parental rules and “social-entertainment” always together with the mediator willingness as additional independent factor. The β -value for the variables examined in the analysis for the relation between cultural context and binge drinking, were lower than in the second analysis. “Social-entertainment” and parental rules were still significant, this indicates a partial mediation of the impulsive pathway between cultural context and binge drinking (see table 2, figure 3 and figure 4 for the results in detail). To proof these results a Sobel test was used (Sobel, 1982). It was found that willingness is a significant partial mediator for the variables parental rules ($t=-2.95$ $p=0.003$) and “social-entertainment” ($t=3.45$ $p=0.001$).

The hypothesis that the cultural context is mediated by the impulsive pathway is partly true.

Table 2
Results of the Regression Analyses to Control for Mediation

	B	β	t	Sig.
1. Regressions				
with dependent factor willingness				
aesthetic-intellectual	-0,205	-0,123	-1,781	0,076
social-entertainment	0,617	0,250	3,729	.000
parental rules	-0,053	-0,206	-3,038	0,003
2. Regressions				
with dependent factor binge drinking				
social-entertainment	0,547	0,238	4,186	.000
willingness	0,473	0,507	8,919	.000
parental rules	-0,043	-0,179	-3,126	0,002
willingness	0,494	0, 529	9,254	.000

Figure 3. Mediation of “Social-Entertainment”

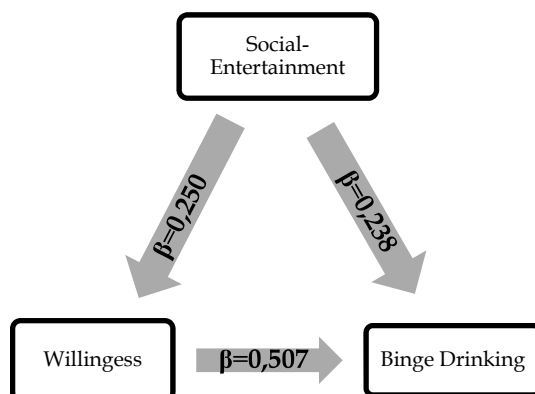
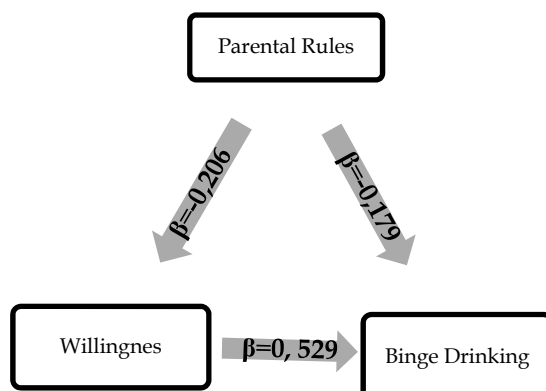


Figure 4. Mediation of Parental Rules



6. Discussion

The results of the study show that the main assumptions of the Twente Model of Binge Drinking are true.

6.1 Relationship between Cultural Context and Binge Drinking

As expected the relationship with binge drinking was dependent on the kind of leisure activity. Although the reliability of the leisure activity scale was very low, the individual constructs still delivered important information. “Social-entertainment” was positively linked

to binge drinking, indicating that unstructured activities, like going out, and high social involvement during that convey binge drinking. The more introvert activity “aesthetic-intellectual” is not necessary more organized but lacks the social component. Here, a negative relation with binge drinking was found. So, frequent binge drinking is linked with frequent “social-entertainment” activities. These findings are partly supported by other research. Mahoney and Stattin (2000) found that especially social unstructured situations are linked to deviant behavior. In opposite to our findings are studies that are stating structured activities to be linked negatively to alcohol use (Mahoney & Stattin, 2000; Osgood et al., 1996).

From the parenting scales, only parental rules were found to have a significant influence on binge drinking. This finding supports what other studies have found, namely that rules are the main predictor of all parental behavior by binge drinking (Van der Vorst et al., 2006; Patock-Peckham et al., 2001). The stronger the rules, the less the child engages in the binge drinking pattern. It might be helpful to analyze the circumstances in which the rules are provided by the parents to develop an intervention program. Therefore, it might be of interest to determine the slightly positive relation to parental monitoring and the slightly negative relation to parental communication. This may help to understand under which conditions the rules are effective. To target these different aspects of parenting, the use of classical parenting styles as predictors could be necessary. Additionally these aspects would be beneficial for other current research in education.

6.2 Relationships Within the Impulsive Pathway

The data lacked to prove that prototype favorability is in a relationship with willingness. This is analog with the finding of Hyde and White (2009), who found that prototype similarity predicted the willingness to donate an organ but not prototype favorability. So, this part of the impulsive pathway has to be reconsidered and possibly changed.

Gerrard et al. (2007) mentioned that the prototype is often not positive at all and this could also be seen in the results of this study. Indeed, prototype similarity was linked to willingness but the concept lacked further relations to the cultural variables to be helpful in explaining the model. This might be improved by assigning more than one question to this construct.

6.3 Relationship between Impulsive Pathway and Binge Drinking

Willingness had a positive relation to binge drinking thus confirming the expectations: High willingness leads to higher frequent binge drinking patterns. This is supported by research of Gibbons et al. (1998) that showed that high willingness predicts more unhealthy behavior so as smoking and unprotected sex.

6.4 Relationship between Cultural Context and Impulsive Pathway

A relation between the cultural context and the impulsive pathway could be found. The leisure activities “at home” and “social-entertainment” had both positive relationships with willingness, showing that unstructured and unmonitored activities heighten the willingness to drink alcohol. Those results are only supported by studies which showed that not organized leisure activities are connected to direct alcohol use (Mahoney & Stattin, 2000; Caldwell & Darling, 1999).

Among the parental scales, parental communication and rules were of influence. Therefore it seems that communication about alcohol diminish the willingness to drink, so do strict rules about alcohol. Communication about alcohol related rules were shown to predict a healthy use of alcohol (Van der Vorst et al., 2006). So rules and communication might influence values and prototype and thus have influence on willingness (Wills, Gibbons, Gerrard, Murry & Brody, 2003; Cleveland et al., 2005).

6.5 Mediation of the Cultural Context

The current data indicates a partial mediation by willingness for two variables from the cultural context. One mediation could be found for “social-entertainment” and one for parental rules. The partial mediation indicates that besides the relationship via willingness also still a direct relationship from this variables to binge drinking exist. The mediations confirm that cultural variables can have influence on the information processing that is relevant for the decision to engage in the behavior. Thus interventions targeting this variables could be helpful to reduce binge drinking among adolescents.

It is obvious why parental rules is the parenting variable that is mediated, because it was the only variable with relation to binge drinking. The case is more difficult for “social-entertainment”. This variable could be mediated because beside its unstructured character it

could have another link to binge drinking, namely that it takes often place in contexts (disco) where also alcohol consumption is common. This double relationship may have heightened the strength of relation to willingness and binge drinking to such amount, that the link could be easier seen than that for “aesthetic-intellectual”. However this facts make it impossible to decide if the level of organization plays a role by the mediation or of the context is of influence.

6.6 Benefits and Limitations

There are some limitations of this study. The majority of participants had the same educational level. This could have caused very similar background variables and similar values. Due to this homogenous data it was maybe difficult to show further significant relations in the sample which may exist in the whole population. This effect might be also heightened through the fact that the sample did not inherit many heavy drinkers, this could be due to the majority of women. Van de Pol and Duijser (2003) found that females drink less alcohol on one evening than males do.

Only objective alcohol measures were used, but the concept of norm glasses remains difficult to use in practice because it demands form the participant knowledge over their own amount of intake and it is necessary to make some calculations during the survey. This could have falsified the results because participants may not remind correctly the number of glasses each drink has or have only a vague idea of how much they drink on an evening. In the study of Poikolainen (1985) was shown that the reminded amount of alcohol intake was often underestimated to the actual intake.

It was not possible to link the level of structure clearly to binge drinking with the current leisure activity scale. Therefore, the scale must be revised and the focus for the underlying construct must aim more the level of structure. This change might also heighten the reliability to an acceptable amount. It might be possible that the leisure activities trapped more characteristics of activities than the amount of organization. Those characteristics could be especial frequent for people with certain traits and values which in return are the real aspect influencing binge drinking. The study of MacManus & Furnham (2006) showed that aesthetic activities are linked to personality (e.g. less extroversion) and social background. The examination of leisure activities as mediator of the personality and binge drinking could be a topic for further research.

Furthermore a cross sectional design was used, which limits the explanatory power for causal relations within the examined model.

Although the concept of norm glasses may have some limitations it is also one advantage in this study, because it is well-proven and makes comparison with other studies in the domain easier.

6.7 Conclusion

To sum up, most of the hypotheses could be confirmed with the data.

It was expected that unstructured leisure activities would be positively linked to binge drinking. This was partly the case but could only significantly be confirmed by the “social-entertainment” activity. Similar the hypothesis that high scores by the parental scales speak for low binge drinking was confirmed. Here, significant evidence could be found for parental rules. Furthermore, the idea of mediation by the impulsive pathway could be shown for the cultural variables parental rules and “social-entertainment”.

Although the “Prototype Willingness Model” as impulsive pathway could not be proven, high willingness is linked to frequent binge drinking, holding the expectation.

As expected some of the cultural variables had influence on willingness. However this relationship could no be established for cultural context and prototype favorability/similarity.

The cultural variables parental rules and “social-entertainment” were partially mediated by the impulsive pathway.

The Twente Model of Binge drinking provides a good framework for research in the domain of alcohol consumption. The main assumption, so as the relation between cultural context, impulsive pathway and binge drinking are true. After improving some links e.g. in the impulsive pathway the model may be also useful to explain other general unhealthy behaviors as smoking, drug use and unprotected sex.

7. References

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