UNIVERSITY OF TWENTE

The influence of mood on the creation of compensatory health beliefs

In Partial Fulfilment of the Requirement

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Abstract

Objective: The prevalence of binge drinking among adolescents in Europe has increased although the negative consequences of alcohol are known. A possible explanation for this paradox phenomenon can be given by compensatory health beliefs (CHBs), which arise when individuals have to face a temptation between a desire and a healthy goal. In this context, compensatory health beliefs are beliefs that the negative effects of alcohol consumption can be compensated for by engaging in a healthy behavior at a later time. The temptation leads to a motivational conflict resulting in cognitive dissonance, which can be reduced by compensatory health beliefs. The aim of this study was to examine whether it is possible to manipulate the creation of compensatory health beliefs by mood, as research on this topic is still limited.

Design: For the analysis data from an experimental online survey study was used.

Subjects: The convenience sample consisted of 108 University students. The mean age was 23,35 years and the majority of the participants were German.

Method: First the randomization between the positive and negative condition of the developed experiment was tested. Afterwards the manipulation, including the positive and negative alcohol-specific commercials, was tested whether a difference in the questionnaires was found. Furthermore a mediator analysis for mood was conducted.

Results: The randomization between the positive and negative condition was successful. Evidence was found that the manipulation had effect on mood. However, the manipulation did neither affect the creation of compensatory health beliefs nor the intention.

Conclusion: The experiment was effective on the positive and negative affect but did not influence the creation of compensatory health beliefs.

Abstract

Thema: 'Binge drinking' onder adolescenten neemt met grote mate in Europa toe, ondanks het feit dat de negatieve consequenties van alcohol bekend zijn. Dit paradoxe fenomeen kan door 'Compensatory health beliefs' (CHBs) verklaard worden. CHBs ontstaan wanneer individuen te maken krijgen met een verleiding en zij deze niet kunnen weerstaan. Deze verleiding staat dan in contrast met een gezondheidsdoel. In deze context zijn CHBs overtuigingen, dat de negatieve effecten van alcoholconsumptie gecompenseerd worden door een gezond gedrag op een latere tijdstip. De verleiding leidt tot een motivatieconflict, welke in cognitieve dissonantie resulteert en door CHBs reduceert kan worden. Het doel van deze studie was te onderzoeken of het mogelijk is om het creëren van 'Compensatory health beliefs' door de stemming bij mensen te beïnvloeden.

Onderzoeksopzet: In deze studie is gebruik gemaakt van een experimentele online enquête.

Proefpersonen: 108 studenten hebben deelgenomen. De gemiddelde leeftijd was 23,35 jaar en de meerderheid van de proefpersonen was Duits.

Methode: Ten eerst werd de randomisatie tussen de positieve en negatieve conditie van de ontwikkelde manipulatie getest. Daarna werd getest of er een verschil in de questionnaires door de manipulatie was ontstaan. Tot slot werd er een mediator analyse voor stemming uitgevoerd.

Resultaten: De randomisatie tussen de positieve en negatieve conditie was succesvol. Het werd duidelijk dat de manipulatie effect had op de stemming. Echter, had de manipulatie geen invloed op het creëren van CHBs of op de intentie.

Conclusie: Het experiment was effectief bij het beïnvloeden van positieve en negatieve affect, maar had geen effect op het creëren van CHBs.

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1. Introduction

The purpose of this research was to influence the creation of compensatory health beliefs (CHBs) in the context of alcohol consumption. Contemporary it is unclear whether CHBs can predict the intention to engage in or reduce alcohol consumption. Therefore a manipulation was conducted with positive and negative alcohol-specific commercials, which was expected to have an effect on mood and the creation of CHBs. Especially from the negative condition it was expected to create a motivational conflict, which in turn could lead to more CHBs. This research was conducted parallel to another research, utilizing the same manipulation but with a focus on self-efficacy and health awareness in relation to CHBs.

1.1 Compensatory health belief model

The hedonic principle refers to the phenomena that people strive to accomplish a reasonable balance between maximizing their pleasure and minimizing harm. Concerning health, the 'Compensatory Health Belief' (CHB) model is a useful tool to implicitly measure the compensatory health beliefs of a person. CHBs are beliefs that the negative effects of an unhealthy but pleasant behavior can be compensated for by engaging in another, healthy, behavior at a later time. In the context of this research "I can drink tonight and celebrate because I will exercise tomorrow noon" is an example of a compensatory health belief (Rabia, Knäuper & Miquelon, 2006). Given the fact that individuals are more or less unconsciously aware of their beliefs and the decisions made are more irrational than rational, the CHB model seems most suitable for the investigation of such implicit beliefs.

The CHB model (Figure 1.) contains four major components that include the motivational conflict (cognitive dissonance); goal self-concordance, which describes the extent to which people pursue their personal goals; self-efficacy and implementation intentions. As stated in the theory of planned behavior, behavior is predicted by three factors: positive and/ or negative attitudes towards the behavior, perceived behavioral control (self-efficacy) and the subjective norms (Ajzen, 1991). In this research the focus will be on Intention and self-efficacy.

According to the CHB model there are three possible strategies when the individual is faced with the temptation of drinking alcohol. The first strategy would be that the individual decides to resist the desire, in this context not to drink alcohol. The second strategy would be to adapt the perception of risks and outcomes expectancies "I should not drink too much otherwise I will probably get headache tomorrow". The last strategy which is least challenging at all in comparison to the other strategies, would be to activate compensatory health beliefs (Rabia et. al., 2006). Compensatory health beliefs often arise when individuals have to face a temptation between the desire and a healthy goal. This temptation often creates

a motivational conflict, which is defined by Festinger (1957) as “the perception of a discrepancy among cognitions generating a negative intra-personal state of cognitive dissonance”. Rabia et al. (2006) assume that CHBs only become activated when a motivational conflict arises because the individual believes that the desired behavior may be risky for the fulfilment of one of the health goals. For instance when the behavior is not desirable and the person has high health-related self-efficacy, then the person would be capable of resisting the desire or as in this particular example “to celebrate without drinking alcohol”. Moreover there is a probability that CHBs are not activated at all. This is the case when people are faced with a temptation, which is extremely desirable and they are unable to resist. As Rabia et al. (2006) assume the reason for this might be that they feel the strength of the desire justifies the behavior.

Holding up CHBs can have two pitfalls. First individuals might be convinced or falsely believe that the execution of the compensatory behavior will neutralize the negative effects of the desired behavior. Second, Rabia et al. (2006) emphasize that the “overall effect on health of holding a lot of these beliefs can be expected to be negative”.

Among others, research from Rabia et al. (2006) has shown that “Compensatory behavior is more likely to be implemented when an implementation intention was clearly outlined.” and that if a person has been primed with a temptation than CHBs should be more prevalent. Especially the value of the goals has to be taken into account, because the importance of the desire will also shape the motivational conflict. Shah & Kruglanski (2003) defined goals as cognitive representations that can be activated. Furthermore it is possible that the importance of a goal can be strengthened if it is primed by presenting means towards achieving that goal. The question is whether visual stimulation and or mood can activate compensatory health beliefs or whether it is possible that students are able to resist binge drinking when primed through manipulation. Therefore it was found interesting for this research to conduct a manipulation through commercials, which might have an influence on intention, mood and the creation of compensatory health beliefs.

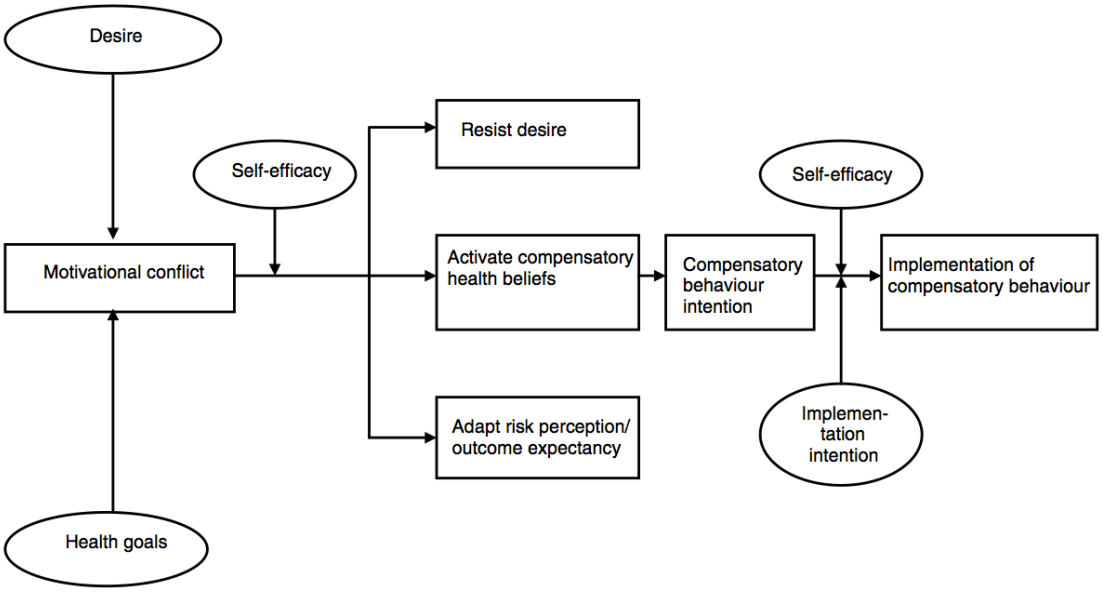

Figure 1. Compensatory Health Belief model by Rabia, Knäuper & Miquelon 2006

1.2 Intention

Intention plays a crucial role in the implementation of the compensatory behavior. If the intention is too weak the implementation of the compensatory behavior will probably not take place, resulting in more negative consequences from the pleasant but unhealthy desire.

Concerning the implementation of intentions, it seems that they are effective because as soon as the environmental cue is encountered the intended behavior will automatically take place due to the strong association between the situation and behavior in memory. Furthermore goal intentions and implementation have to be differentiated. Implementation of intentions can be described as a self-regulatory strategy that involves self-efficacy in order to initiate the compensating behavior in the future (Webb & Sheeran, 2003). Rabia et al. (2006) emphasize that intention and perceived behavioral control (self-efficacy) determine whether an individual will perform certain behavior. Concerning CHBs, Kronick & Knäuper (2010) mentioned that holding compensatory health beliefs has been found to be associated with lower goal achievement, which might be useful for this research. Moreover it seems interesting whether it is possible to predict the intention to reduce alcohol consumption by the extent of compensatory health beliefs.

1.3 Alcohol

Drinking alcohol is common in today's society although it can have different negative consequences for the individual and the social environment. The negative consequences of drinking alcohol is the risk of developing health problems such as alcohol dependence, liver cirrhosis, cancers and injuries (World Health Organization [WHO], 2014). Furthermore, the WHO ranked the harmful use of alcohol among the top five risk factors for disease, disability and death throughout the world given the fact that it has been a cause in more than two hundred diseases and injury conditions. In 2010 the worldwide consumption of alcohol per person (older then 15 years) was equal to 6.2 liters of pure alcohol per year.

"*Heavy episodic drinking"* or "*Binge drinking"* is defined as a consumption of at least 60 grams of pure alcohol, which is equal to six standard drinks on at least one single occasion (WHO, 2014). Especially students seem to be inclined to binge drinking (Wechsler, Lee, Kuo, Seibring, Nelson & Lee, 2002). Additionally research from Kuntsche, Rehm & Gmel (2004) indicated that the prevalence of binge drinking among adolescents in Europe has increased. These findings are supported by data from WHO (2014), which states that the highest consumption continues to be found in the European Region and the Region of America. In addition it has been shown that high-income countries have the highest alcohol per capita consumption (APC).

The harmful use of alcohol causes detrimental health and social consequences for the drinker, the people around the drinker and society at large, as well as the consequences of drinking that are associated with increased risk of adverse health outcomes. Harmful use of alcohol causes approximately 3.3 million deaths every year, which is equal to 5.9% of all deaths. To underline the problem, the predicted increase in alcohol consumption with respect to the growing population in the world will lead to a disease burden as well as a social and economic burden (WHO, 2014). Therefore the need for effective prevention is inevitable and has to be implemented worldwide in order to avoid future burden, given negative effects of alcohol consumption. Due to the fact that students associate alcohol consumption with positive and negative consequences, it was found interesting to examine the effects of mood on the creation of CHBs in this target group (Park, 2004).

1.4 Mood

Rabia et al. (2006) stated that the motivational conflict between the tempting behavior and the health goal, leads to the activation of a CHB. Therefore it seems interesting whether it is possible to prime negative affects with commercials, which should enlarge the motivational conflict, resulting in more CHBs (Stein, Goldman & Del Boca, 2000).

Moreover, research on mood indicated that positive affect is related to different health practices including exercise, nutrition and self-care practices (Griffin, Friend, Eitel & Lobel, 1993). Research from Townshend & Duka (2005) mentioned that low mood states and loss of executive function are related to binge drinking. Further, it seems promising that mood can enhance self-efficacy in order to influence the compensatory behavior. Research from Kavanagh & Bower (1985) has shown that joy can influence self-efficacy and the perceived capabilities of the individual in a positive way, whereas sadness can inhibit self-efficacy. These findings are important in order to test the effects of mood in this research. Mood is integrated as a mediator variable in the research model, which is shown in Figure 2. The manipulation through positive and negative alcohol-specific commercials is the independent variable, whereas the compensatory health belief represents the dependent variable, which in turn will affect intention. Therefore mood might reveal information that can be used for a better understanding of the relationship between the independent and dependent variable and may explain how this can effect compensatory health beliefs and the intention to reduce alcohol consumption.

1.5 Self-efficacy

When one's self-efficacy is too low then the implementation of the compensatory behavior will probably not take place, resulting in more negative consequences from the pleasant but unhealthy desire, which triggered the motivational conflict in the first place. According to Bandura (1977), self-efficacy is defined as "one's belief that one is or is not capable of performing a behavior or set of behaviors". It is important to note that expectations of self-efficacy can be re-evaluated due to different techniques and methods from the past. For instance "I was not able to resist drinking alcohol because my wife died, but nowadays I can because I learned from my mistakes" (Maddux, Sherer & Rogers, 1982). According to Webb & Sheeran (2003) ''Ego-depletion is the term used to describe the temporary depletion of self-regulatory capacity by an initial act of self-control". Therefore ego-depletion has to be taken into account because exerting self-control makes it possible to behave flexibly, to override undesirable responses, and to avoid temptation. When individuals are faced with the temptation to drink alcohol, self-efficacy as well as situational cues for the implementation of intention plays a crucial role for the initiative of the compensatory behavior. Furthermore if the individual has already used resources of self-control in another context, which consequently will lead to ego-depletion, the probability that the compensatory behavior will not take place is high (Baumeister, Bratslavsky, Muraven & Tice, 1998).

1.6 Aims of this study

The aim of this study is to examine the influence of positive and negative alcohol-specific commercials on the creation of compensatory health beliefs among University students. Furthermore the aim of this study is to find out whether the manipulation through the assigned condition is mediated by mood and if it is possible to predict the intention to reduce alcohol consumption by the compensatory health beliefs of students.

The manipulation takes place through a setting where commercials concerning alcohol are presented in a positive and negative context. The manipulation is considered as a priming effect on mood. Therefore the negative affect is expected to have a deeper impact in creating CHBs.

Although there is some correlational research available on CHBs, no experimental research has been conducted on the application of visual manipulation in relation with CHBs and mood. Therefore it seems necessary to evaluate whether the manipulation can influence mood and whether the manipulation can influence the creation of the compensatory health beliefs.

To examine this the following research question was formulated:

"To what extent do positive and negative alcohol-specific commercials influence the creation of compensatory health beliefs? "

To answer this research question the following sub questions were formulated:

1. "To what extent does the assigned condition of the manipulation influence mood?"

2."To what extent are compensatory health beliefs more mediated by negative affects compared to positive affects?"

3."To what extent can intention to reduce alcohol consumption be predicted by compensatory health beliefs?"

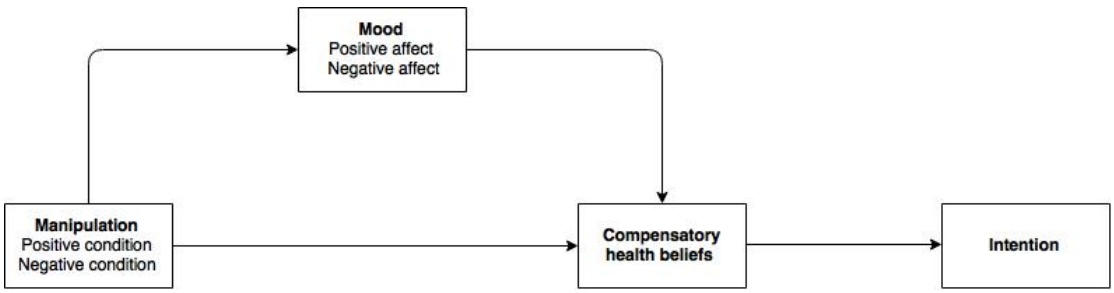

*Figure 2***.** The research model

2. Method

2.1 Participants

A total number of 148 respondents participated in the online study. The participants were recruited through the participant research pool 'Sona systems' from the University of Twente. In addition the link from the online survey was posted on Facebook and send to fellow students to gather data from people who did not have the opportunity to access the "Sona system" platform. Eight participants were found via 'Sona systems' whereas 97 were recruited via Facebook or personal messages.

105 of 148 (70.95%) participants that started completed the full survey. The cases of 40 (27.03%) participants were excluded from further analysis because of incomplete data. Three participants did not finish the complete survey but still were taken into the data analysis. In total 105 subjects were taken into consideration for the current analyses. Of the total number of attendants (N=105) 67.62% were male and 32.38% were female. The participants had an average age of 23,35 (SD=5.108). Under the 105 participants, 76 (72.38%) belonged to the German nationality and 29 (27.62%) to the Dutch nationality. 81.91% of all attendants were students, whereof 13.33% reported that they were currently working and 4.76% reported that they had other occupations.

2.2 Procedure

The study was approved by the ethics committee of the faculty of Behavioral Science from the University of Twente. The data collection took place between the 6th of April and the 7th of May in 2015. The experimental survey study consisted of two different conditions where the manipulation was taking place. The participants were randomly assigned to a negative or a positive condition. The "negative" condition contained an anti-alcohol commercial, which shows a man who had too many drinks at a barbecue party (xFrozenFishx's channel, 2009). Suddenly the man stumbled while dancing in the living room, pushing a pregnant woman against a corner of a table. Consequently the pregnant woman lost her baby. The "positive condition" illustrated a Super Bowl commercial from Bud light in which a guy got a free beer at a bar for whatever happens next (Bud Light, 2015). The guy walked down the street with his friends and had to throw an oversized coin into an automat. In the next scene he had to play Pac-Man in real life, resulting in winning the game and receiving another free beer.

After watching the video the participants were confronted with a control question in both conditions. Next the participant had to face several items, which intended to measure whether it is possible to manipulate the compensatory health beliefs. Therefore CHB was

related to four constructs for the purpose of developing an extended version of the Compensatory Health Belief model. The five constructs were 1. Compensatory health belief (CHB), 2. Mood, 3. Health awareness, 4. Self-efficacy and 5. Intention.

The following constructs were defined in the context of this research concerning CHBs and alcohol consumption. *CHB* was defined as the extent to which people had beliefs that the negative effects of an unhealthy but pleasant behavior could be compensated for, by engaging in another, healthy behavior at a later time. *Mood* was defined as a temporary state of mind or feeling of a person at a certain point of time. *Self-efficacy* measured the perceived capability of a person to change their current behavior towards alcohol consumption. The construct *Health awareness* measured the awareness of a person about self-determined goals related to his or her own health. *Intention* measured to what extent people plan to change their future alcohol consumption.

2.3 Instruments

Other scales were included to the already existing 'Compensatory Health Belief' model from Rabia et al. (2006) in order to examine how other constructs are related to CHBs.

2.3.1 Compensatory Health Belief (CHB)

In order to measure the compensatory health beliefs of a person, 10 items were used from the questionnaire developed by Rabia et al. (2006). For example: "The effects of regularly drinking alcohol can be made up by eating healthy". The purpose was to find out whether people would have more compensatory health beliefs and whether they agree or disagree. The items were conducted with a 5-point-likert-scale, which ranged from 1=Totally disagree, to 5=Totally agree. A high score on the CHB items indicates that people engage to a high degree on compensation behavior and therefore holding a lot of CHBs in a tempting situation. A low score indicates that people do not have a lot of CHBs. An overall Cronbach's alpha of α=0.79 was found for the nine-items 'Compensatory health belief' scale, which is defined as good. Due to the fact that item 8 showed a negative inter- item correlation it was deleted in order to enlarge the Cronbach's alpha.

2.3.2 Intention

The construct intention contained five items, which measure to what extent people plan to change their future alcohol consumption. These five items were concerned with the behavior that people are planning to perform in the future, for example: *"I am going to reduce my alcohol consumption in the following 12 months"*. Given the fact that it is not

possible for this research to measure or observe actual behavior regarding alcohol consumption in the future, intentions are measured to give an indication of planned behavior. The items could be answered with a 5-point-likert-scale, which ranged from 1 =Totally Agree, to 5=Totally disagree. A high score on this scale indicate people's intention to change their future behavior regarding alcohol consumption. A low score on this scale indicates that people carry on their habitual behavior. For the 'Intention' scale two items had to be deleted because of their inferior item-total correlation (Item 4=0.11; Item 5= 0.15) which led to a Cronbach's alpha of α=0.65 in the remaining three items.

2.3.3 General alcohol consumption

Besides the demographic variables, two items were formulated regarding alcohol consumption as descriptive questions in order to measure and estimate the alcohol consumption from the participants. The first item 'Standard Consumption' gives an indication about alcohol consumption in the last four weeks and the second item 'Binge drinking' gives an indication about having more than five glasses of alcohol on one occasion. A high score on these two items indicates that people have regular and increased consumption behavior with regard to frequency and the amount of alcohol. A relatively low score indicates that people have irregular and decreased consumer behavior with regard to the frequency and the amount of alcohol. For both items the possible answers were presented using seven possibilities, which ranged from 1= Zero glasses of alcohol in the last four weeks until 7= More than 10 glasses of alcohol in the last 4 weeks. These descriptive questions were asked before the manipulation took place in order to avoid any biases or effects through the manipulation. After the manipulation the five constructs were introduced.

2.3.4 Positive and negative affect schedule (PANAS)

The positive and negative affect schedule (PANAS) developed by Watson, Clark & Tellegen (1988) was the first construct measured after the manipulation through visual simulation took place. Research confirmed that the PANAS is still a valid and reliable instrument in order to measure the overall state of mind of a person (Engelen, De Peuter, Victoir, Van Diest & Van den Bergh, 2006). Furthermore for this research the PANAS is useful as an indication for how a person reacts on a perceived stimulus. In this context the attendants were asked about the state of mind or feeling they experience right now instead of overall. The participants had to rate 20 items on a 5-point-likert-scale from 1=Very slightly or Not at all, to 5=Extremely. The 20 Items were divided into two categories: "Positive affect (PA)" and "Negative affect (NA)". The category PA consisted of items: 1.Interested, 3.Excited, 5.Strong, 9.Enthusiastic, 10.Proud, 12.Alert, 14.Inspired, 16.Determined,

17.Attentive and 19.Active. Scores could range from 10 – 50 with higher scores representing higher levels of positive affect. The category NA consisted of items: 2.Distressed, 4.Upset, 6.Guilty, 7.Scared, 8.Hostile 11.Irritable, 13.Ashamed, 15.Nervous, 18.Jittery and 20.Afraid. Scores can range from 10 – 50, with lower scores representing lower levels of negative affect. The PANAS indicates the mood a person is experiencing right now. It was hypothesized that people with higher CHB scores would score higher on negative affect, which can be justified by the fact that it is presupposed that negative affect should have a direct influence on the activation of the CHB of a person. The Cronbach's alpha of the subscales were α=0.81 for positive affect and α=0.89 for the negative effect scale.

2.3.5 Self-efficacy

The construct self-efficacy contained five items regarding the perceived capability of a person to change their current behavior towards alcohol consumption. Due to the fact that no appropriate measures were available to measure the self-efficacy of a person with regard to the capability to resist the temptation of alcohol in a given situation the five items had to be developed. The items were mainly influenced by Bandura (1977) and his concepts of self-efficacy and were designed to find out whether a person experience him/herself as capable of executing an action if he/she is willing to do so. "*I am sure that I am able to Reduce my alcohol consumption in favor of living healthy*" is one possible example of a self-efficacy item. The attendants could answer to the item with a 5-point-likert-scale, which ranged from 1=Totally disagree, to 5=Totally agree. A high score on this scale indicates that people experience themselves as capable of changing their alcohol consumption in a healthy way. A low score indicates that people do not feel capable to change their alcohol consumption even if they decide to do so. A Cronbach's alpha of α=0.74 was found for the 'Self-efficacy' scale.

2.3.6 Health awareness

The last construct contained five items, which measured the health awareness of a person. The items give information about the degree to which a person has generally thought about his or her own health and the future. Given the fact that there was no scale available for CHB and health awareness, it was necessary for this study to deduce the items from already existent literature. According to this literature mainly given by Gollwitzer & Oettingen (1998) five items were created. One example: "*I already live a healthy life so I don't have to change my lifestyle*", which could be answered with a 5-point-likert-scale. This scale ranged from 1=Totally disagree, to 5=Totally agree. A high score on this scale indicates that people are not really aware about their health or respectively have problems with resisting the temptation in a given situation. A low score indicates that people are aware with regard to their health or at

least thought about their general health. For ‘Health awareness’, three items had to be deleted, which could not be included in the analysis even after a recoding approach (Item 1=0.06; Item 2= 0.11; Item 3= 0.18), resulting in a Cronbach’s alpha of α=0.68.

2.4 Data analysis

First of all the alcohol consumption of women and men were measured in order to evaluate the drinking behavior. Accordingly the distribution in the positive and negative condition was assessed in order to prove that the randomization was successful. Next, the manipulation check was examined through control questions, which should illustrate whether the participants were paying attention to the video. To test the internal consistency of the different constructs, Cronbach’s alpha was examined for the developed ‘CHB’ scale, the ‘Intention’ scale, the ‘PANAS’, the ‘Self-efficacy’ scale, and the ‘Health awareness’ scale. Following this, the reliability was reviewed in order to delete items with insufficient item-total correlations. The targeted value of α was defined as at least 0.6.

Pearson correlation analysis was conducted in order to detect correlations between 1.Compensatory Health Belief (CHB), 2.Intention, 3.Mood (Positive and negative affect), 4.Self-efficacy and 5.Health awareness to examine the external validity.

Due to the fact that this study contained an experimental setting, T- tests for independent samples were conducted in order to examine significant differences between the constructs of interest and the assigned condition of the manipulation. Multivariate regression analysis was carried out in order to find out whether an interaction effect took place. A mediator analysis was carried out to examine whether mood acted as a mediator between the assigned condition of the manipulation as independent variable and CHB the dependent variable (Baron & Kenny, 1986).

3. Results

3.1 Descriptive statistics

Concerning women, the mean of the variable 'Standard Consumption' was 3.61 (SD=1.57). On average, women consumed three to four times alcohol in the last month. The mean of 'Binge drinking' was 2.36 (SD=1.18); which implies that on average, women were inclined to consume five or more glasses of alcohol one to two times in the last month. Concerning men, the mean of 'Standard Consumption' was 5.03 (SD=1.91). On average, men consumed seven to eight times alcohol in the last month. The mean of 'Binge drinking' was 3.83 (SD=1.62), thus on average, men were inclined to binge drinking three to four times in the last month. On average, women had a significant lower score on the frequency of both standard consumption ($p < .01$) and binge drinking ($p < .01$) compared to men.

3.2 Randomization and manipulation

In Table 1 the distribution of age, gender and nationality in the negative and positive condition are shown. The distributions were comparable in the positive and negative condition concerning gender (p=.17), age (p=.56) and nationality (p=.71), which confirms that the randomization of the experiment was successful.

Table 1. *Distribution of age, gender and nationality in the negative and positive condition including the manipulation check*

	Negative Condition (N= 49)	Positive Condition (N=59)	p (2- tailed)
Age, Mean (SD)	23.04 (SD=2.83)	23.61 (SD=6.34)	.561
Gender, N (%)			.172
Women	13 (26.5 %)	23 (39%)	
Man	36 (73.5 %)	36 (61 %)	
Nationality			.713
Dutch	14 (28.6 %)	15 (25.4 %)	
German	35 (71.4 %)	44 (74.6 %)	
Manipulation check, N (%)			
Correct answers	44 (89.8%)	40 (67.8%)	

Of the total number of attendants (N=108), 59 were assigned to the positive whereas 49 were assigned to the negative condition. After the video a manipulation check was conducted through control questions in order to examine whether the participants were paying attention to the video. As shown in table 1, in the positive condition, 40 participants (67.8 %) answered the control question right, whereas 44 (89.8%) of the participants in the negative condition chose the correct answer. The number of right answers is defined as sufficient for both conditions.

3.3 Correlations

A correlation analysis was conducted in order to examine the associations between the variables of interest. In the following paragraph only correlations will be considered, which could reveal useful information to answer the research and sub questions.

As can be seen in Table 2, the only significant correlation in the total sample was found between self-efficacy and health awareness (r=-.28), which indicates that people with a high score on self-efficacy will not be as aware of their health as people who score lower on this scale. Due to the fact that few significant correlations were found, the data was additionally split up by the negative and positive condition of the manipulation resulting in table 3 and 4.

Table 2. *Correlation coefficient between the different variables of the total sample*

	1.	2.	3.	4.	5.	6.
1. Compensatory health belief	-	.07	.07	.05	-.08	.10
2. Intention		-	-.06	.11	.04	.13
3. Positive affect			-	-.11	-.04	-.08
4. Negative affect				-	-.15	.13
5. Self-efficacy					-	-.28**
6. Health awareness						-

**. p < 0.01

*. p < 0.05

As expected, a stronger correlation was found between negative affect and CHB in the negative condition (r=.25), which indicates that people who are more negatively affected, are more likely to have more CHBs. In the positive condition which is shown in table 4, there was no correlation between negative affect and CHB (r=.07).

Table 3. *Correlation coefficient of the different variables with the negative condition*

	1.	2.	3.	4.	5.	6.
1. Compensatory health belief	-	-.01	.17	.25*	-.22	.26*
2. Intention		-	-.02	.04	-.12	-.03
3. Positive affect			-	.03	.04	-.11
4. Negative affect				-	-.16	-.00
5. Self-efficacy					-	-.52**
6. Health awareness						-

**. p < 0.01

*. p < 0.05

As can be seen in table 4, a negative but non-significant correlation was found between positive affect and CHB in the positive condition (r=-.11), which indicates that people who are positive affected are inclined to have less CHBs compared to the negative condition (r=.17). This gives important information about the first sub question, namely that negative affect more strongly enhances the creation of CHBs compared to positive affect.

Table 4. *Correlation coefficient of the different variables with the positive condition*

	1.	2.	3.	4.	5.	6.
1. Compensatory health belief	-	.16	-.11	.07	.04	.00
2. Intention		-	-.07	.18	.15	.26*
3. Positive affect			-	.21	-.07	.02
4. Negative affect				-	-.29*	.14
5. Self-efficacy					-	-.14
6. Health awareness						-

**. p < 0.01

*. p < 0.05

A significant and stronger correlation was found between CHB and health awareness in the negative condition (r=.26), compared to the positive condition (r=.00). Furthermore a significant negative correlation was found in the negative condition between self-efficacy and health awareness (r=-.52). Moreover a stronger correlation was found in the positive condition between CHB and intention (r=.16), which indicates that people who have more

CHBs are also more intended to reduce their alcohol consumption compared to the negative condition (r=-.01). Furthermore a negative correlation was found between negative affect and self-efficacy (r=-.29), compared to the negative condition (r=-.16). In the positive condition, intention was positively associated with health awareness (r=.26). Negative affect was negatively associated with self-efficacy (r=-.29) but not in the negative condition.

3.4 T- tests with independent samples

In order to examine significant differences between the assigned condition of the manipulation and the scales, T-tests with independent samples were conducted. As it can be seen from table 5, a difference in the positive affect scale (t (106) =-3.99, p< .01) was found, which differ significantly by the negative and positive condition. Furthermore there is a second significant difference between the negative affect scale and the assigned condition of (t (106) = 7.32, p< .01). These findings indicate that participants who were assigned to the negative condition had a significantly higher score on the negative affect scale than people who were assigned to the positive condition. Complementary to these findings participants who were assigned to the positive condition had significant higher score on the positive affect scale than participants who were assigned to the negative condition. Contrary to expectations, however this did not translate to significant differences in 'CHB', 'Self-efficacy', 'Health awareness' and 'Intention'.

Table 5. *Means and standard deviations of the different variables and the assigned condition including the T-Test of independent samples*

	Negative Condition Mean (SD)	Positive Condition Mean (SD)	t	p (2-tailed)
Compensatory health belief	19.35 (5.80)	20.79 (5.33)	-1.34	.18
Intention	10.23 (2.72)	10.04 (2.78)	.360	.72
Positive affect	19.78 (5.77)	24.25 (5.85)	-3.99	< .01
Negative affect	22.00 (5.67)	14.31 (5.24)	7.32	< .01
Self-efficacy	16.80 (3.03)	16.42 (3.65)	-1.34	.57
Health awareness	6.02 (1.73)	5.60 (1.81)	1.22	.23

3.5 Mediation analysis

The mediation analysis revealed that there was no significant correlation found between the assigned condition of the manipulation (independent variable) and CHB (dependent variable). Assumptions for mediation analyses were not met. Therefore mood can be excluded as a possible mediator between the assigned condition and creation of CHBs.

4. Discussion

The main purpose of this research was to investigate whether mood had an influence on the creation of compensatory health beliefs among University students. Not all expected effects of the experiment appeared. Therefore it can be concluded that the developed manipulation had a strong effect on mood but not on the creation of CHBs. The descriptive statistics over general consumption confirmed the expectation that men consumed more alcohol than women.

Both the randomization and the manipulation were successful. Although the response rate of correct answers after the manipulation check seemed sufficient, it was noticeable that the response rate of the correct answers in the negative condition was higher compared to the positive condition. This could be explained by the fact that the participants in the negative condition had to answer how the commercial ended (She lost her baby) instead of finishing the slogan from the commercial (The perfect beer for: Whatever happens!) in the positive condition. Additionally, the slogan was displayed shortly in the end of the commercial and the possible answers were pretty similar (What's next, Everything). Concerning the internal consistency, which was measured with Cronbach's alpha, all constructs were reliable, ranging from α=0.65 to α=0.89, which were defined as good. The correlations between the construct of interests and the positive and negative condition revealed that the negative condition had more impact on CHBs.

The relation between mood and CHB was addressed because insufficient literature was available. Therefore an experimental survey study was created, including the constructs: 'Compensatory health belief' (CHB), 'Intention' and the 'Positive and Negative affect schedule' (PANAS). In the following paragraph the most important findings are stated and the research questions are answered.

"To what extent do negative and positive alcohol-specific commercials influence the creation of compensatory health beliefs? "

The main goal of this research was to examine the influence of alcohol-specific commercials on the creation of CHBs. It can be concluded that the positive and negative, alcohol-specific commercial, had strong influence on mood but not on the creation of CHBs. Complementary findings implied that the negative condition was stronger associated with the creation of CHBs compared to the positive condition. Surprisingly, positive affect showed a weak association to CHB, in the negative condition. These findings imply that positive as well as negative affect could facilitate the creation of CHBs. Concerning the positive

condition; positive affect was slightly negative related, whereas negative affect was not related to the creation of CHBs.

"To what extent does the assigned condition of the manipulation influence mood?"

It was hypothesized that the level of positive and negative affect would be influenced by the positive and negative alcohol-specific commercial. The results showed that participants who were assigned to the negative condition had a significant higher score on the negative affect scale, whereas participants in the positive condition had a significant higher score on the positive affect scale. Therefore it can be concluded that the manipulation was successful, showing significant differences in the assigned condition regarding mood.

"To what extent are compensatory health beliefs more mediated by negative affects compared to positive affects?"

Complementary to the prior sub question it was assumed that mood could interact as a mediator between the assigned condition and the creation of CHBs. This sub question has been disproved due to the fact that the mediation analysis showed no significant correlation between the assigned condition and CHBs. Therefore mood could be excluded as a mediator.

Rabia et al. (2006) stated that the motivational conflict between the tempting behavior and the health goal, leads to the activation of a CHB. Therefore it was hypothesized that inducing negative affects would enlarge the motivational conflict, resulting in more CHBs. Results showed that in the negative condition, negative affect was stronger associated with the creation of CHBs compared to the positive condition.

Overall it can be concluded that the creation of CHBs was not mediated by mood.

"To what extent can intention to reduce alcohol consumption be predicted by compensatory health beliefs?"

It was assumed that the extent of CHBs could predict the intention to reduce alcohol consumption. The sub question was disconfirmed because no correlation between CHB and intention was found. Results indicate a slightly stronger correlation in the positive condition, which suggests that people who had more CHBs were also more intended to reduce their alcohol consumption compared to the negative condition.

These findings are surprising due to the fact that research from Kronick & Knäuper (2010) showed that holding compensatory beliefs has been found to be associated with lower goal achievement and when people were faced with temptations, representing the motivational conflict, they formed intentions for indulgence in order to compensate. In this

research, the motivational conflict could be triggered by the negative alcohol specific-commercial in order to create CHBs, which in turn could predict the intention.

As Rabia et al. (2006) mentioned it is important that the intention to implement the compensatory behavior is concrete in order to be successful. Therefore the items of intention should be reformulated in more detail and linked to a concrete situation, for example "I am going to reduce my alcohol consumption to zero beverages two weeks prior to the start of the exam period" because otherwise the intention will probably be suspended. Kronick & Knäuper (2010) emphasized that while individuals may intend to engage in the compensatory behavior, factors as decreased motivation, forgetfulness and/ or inconvenience can prevent them from actually performing the compensatory behavior, which suggests that even when intentions are linked to a certain situation it does not assure that the compensatory behavior will take place.

5. Limitations & Future research

The design of this research was difficult given the fact that no prior research was available about the influence of mood on the creation of CHB. Therefore this research might lack sufficient validity in supporting the created research model. While most of the scales used in this research were not standardized, effects of the manipulation could be found. Additionally this research lacks on predictive validity because there was only one instead of two points of measurements. For future research it might be necessary to set up two different points of measurement including a control group in a neutral condition. This approach might be promising because a control group can give insights about biases and confounding variables that affected the results.

In the beginning of the data assembly of this research, the link, which led to the video representing the manipulation, did not function without flaws. This error was mainly responsible for the number of incomplete surveys and might be the reason why the control questions were not always answered correctly because some participants did not watch the commercial at all. Another limitation, (although no variable measured in the current study) the majority of the participants, who were contacted by the researchers, were UT students studying psychology. Given the fact that psychology students are familiar with tests, implicit measurements and manipulations, priming might be less effective compared to other students. This disadvantage of the convenience sample can be probably be made up by the fact that the chosen target group of students was associated with binge drinking and therefore useful for this research although that no neutral condition was given.

Regarding the creation of CHBs, it might be more likely that CHBs are influenced in the long-term because no effects have been found after the manipulation. Moreover future research might include more variables, which could give more insights in the creation of CHBs, such as sensation seeking.

Even though this research might show some weaknesses in measuring the influence of mood in the creation of CHBs, it is important that future research focuses itself on this issue. This research showed some promising results regarding the relation between negative affect and CHB. Therefore anti-alcohol campaigns could profit on how to approach their target group in a more effective way if research on this relation continues. However the question remains whether experimental designs are useful and necessary in order to evaluate the effects on the creation of CHBs.

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7. Appendix

Experimental online survey study

Demographic variables

What is your gender?

- Woman
- Man

How old are you?

_____

Where do you come from?

- Germany
- Netherlands
- Other

What is your current function?

- Student
- Worker
- Other

General alcohol consumption

How many times did you consume alcohol in the last 4 weeks?

- 0
- 1 or 2 times
- 3 or 4 times
- 5 or 6 times
- 7 or 8 times
- 9 or 10 times
- more than 10 times

How many times did you consume 5 or more glasses of alcohol on one occasion in the last 4 weeks?

- 0
- 1 or 2 times
- 3 or 4 times
- 5 or 6 times
- 7 or 8 times
- 9 or 10 times
- more than 10 times

Randomization process assigning participants to the negative or positive condition.

Video (Negative condition)

Control question

Please choose the most correct answer!

What happened to the woman?

- Nothing
- She fell down
- She lost her baby (Right response)

Video (Positive condition)

Control question

Please choose the most correct answer and continue the sentence:

"The perfect beer for...

- ...what's next!
- ...whatever happens. (Right response)
- ...everything.

Mood

In the following you see a scale consisting of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word.

Indicate to what extent you feel this way right now, that is, at the present moment

1= Very slightly 2= A little 3=Moderately 4=Quite a bit 5=Extremely

- Interested
- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid

CHB

To what extent do you agree with the following statements?

1= Totally disagree 2= Disagree 3=Neutral 4= Agree 5=Totally agree

- The effects of regularly drinking alcohol can be made up by eating healthy
- It is alright to drink a lot of alcohol as long as one drinks lots of water to flush it
- The effects of drinking too much alcohol during the weekend can be made up for by not drinking
- Drinking alcohol is okay if one resigns the usage of other substances.
- Alcohol consumption in the weekend has no negative influence on one athletic performance.
- The effects of drinking alcohol only on weekends can be compensated through regular physical activity during the week
- Starting the day with a healthy meal can compensate the negative effects of prior alcohol consumption.
- Regularly consumption of one glass alcohol a day approaches my desire of living healthy more than binge drinking once a week*
- The secondary damage of drinking alcohol can be reduced by exercising
- The relative high consumption of alcohol during my years of study can be compensated through a more conscious lifestyle after this period

Self-efficacy

To what extent do you agree with the following statements?

1= Totally disagree 2= Disagree 3=Neutral 4= Agree 5=Totally agree

I am sure that I am able to...

- Reduce my alcohol consumption in favour of living healthy
- Refuse alcohol in order to fulfil self-determined goal
- Not drink alcohol ever again
- Only to drink at special occasions
- Estimate the limit of my alcohol consumption in order to guarantee my physical integrity

Health awareness

To what extent do you agree with the following statements?

1= Totally disagree 2= Disagree 3=Neutral 4= Agree 5=Totally agree

- I never gave a thought about my health Refuse alcohol in order to fulfil self-determined goal*
- I don´t use any substances or engage in any behavior that could have negative consequences for my health*
- I think a balanced life between healthy and unhealthy behavior is favourable*
- I already live a healthy life so I don't have to change my lifestyle
- I have a lot of trouble with the completion of my health goals because temptation is everywhere

Intention

To what extent do you agree with the following statements?

1= Totally disagree 2= Disagree 3=Neutral 4= Agree 5=Totally agree

- I am going to reduce my alcohol consumption in the following 12 months
- I am going to exercise the next day for 1 ½ hours after alcohol consumption
- I am going to be more aware of my alcohol consumption in favour of living healthy
- I am going to refuse alcohol if I think that I already drank enough*
- I am going to refuse drinking alcohol if I already had drunk more then five glasses in a week on another occasion *

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* = Excluded for analysis.
