Psychological consequences and antecedents of binge-watching in young adults

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Table of Contents

Abstract 2
Introduction 3
Binge-watching 3
Theory of Planned Behavior 5
Personality Traits 6
Compensatory Health Beliefs 7
Method 9
Participants 9
Study Design 9
Materials 9
CHBs for binge-watching 10
Construct of TPB for binge-watching 10
Substance Use Risk Profile Scale 10
Mental Health Continuum Scale 11
Binge-watching 11
Ethical Considerations 11
Analysis 12
Results 13
Prevalence of binge-watching 13
Scoring of mental well-being 13
Bivariate associations between binge-watching, its antecedents and mental well-being 14
Hierarchical regression analyses on binge-watching 17
Mediation of binge-watching 19
Discussion 22
Limitations 24
Recommendations 25
References 27

Abstract

Introduction: Binge-watching is a phenomenon which occurred after the launching of online streaming services. There is not much research done regarding the causes and consequences of this behavior. The Theory of Planned Behavior (TPB) is a valid method to predict behavior. Compensatory Health Beliefs (CHBs) and the personality traits Impulsivity and Sensation Seeking were added to measure their additional explanatory value to TPB. Furthermore, CHBs influence mental well-being with binge-watching as a possible mediator in this relationship.

Method: 172 young adults participated in a cross-sectional online survey study. CHBs, personality traits and the TPB were tested by Persons Correlation and Hierarchical Regression Analyses. The relationship between CHBs and mental well-being and the mediating effect of binge-watching was tested through mediation analysis.

Results: A statistically positively correlation was found between binge-watching and mental well-being. There is no correlation between CHBs and mental well-being. The effect of CHBs on mental well-being was not mediated by binge-watching. Further, the variables of TPB and Impulsivity significantly correlated with binge-watching. The Regression Analyses showed a significant explanatory value from personality traits and CHBs to TPB.

Discussion: The results indicated that CHBs and personality traits can additional to TPB determine binge-watching. Therefore, CHBs could be a good measurement for implicit processes regarding the prediction of binge-watching. The positive correlation between binge-watching and psychological well-being could conclude that binge-watching is a social activity. For follow-up research it is recommended to add the social factor when measuring mental well-being and binge-watching.

Introduction

Binge-watching

In the past it was common that people waited a whole week to watch the next episode of their favorite TV show. Nowadays, internet media providers like Hulu or Netflix make it possible to stream episodes on demand. By paying a small fee every month people can select from a thousand of series and movies to watch without depending on the TV schedule (Lovely, 2016). In the last years, these on-demand websites had great success. According to the Dutch Central Bureau for Statistics (Centraal bureau voor de Statistiek, CBS) almost every household has access to internet (CBS, 2015) and therefore can use it to watch television. When in 2005 about 25% of the Dutch internet users watched TV or listened to the radio online (CBS, 2015), ten years later the amount of Dutch people watching TV online has more than doubled (CBS, 2015). This trend seems to continue and it looks like that one day broadcast TV will be totally replaced by streaming portals (Smith, 2014).

The reasons for using these streaming portals instead of the 'good old' television are numerous. One advantage of on demand video streaming would be that you can watch whenever you want and how much you want because these on-demand services offer whole seasons of series. This also means that you can pause an episode and continue later on the same 'stop moment'. Also, there are no television advertisements which interrupt the movie/series. Another reason for using these services is that you are suggested new series and movies that match with your watching behavior/preferences. Next to that, the availability of a great amount of series and movies on one internet media provider is a great advantage (Lovely, 2016). Other features of on demand video streaming are: pay a small fee every month to have access to all the series and movies; the next episode will be immediately played after ten seconds (after the ending of the episode); streaming portals produce their own series and movies airing only on their platform. However, all of those features and advantages of new television may stimulate a more excessive watching behavior, which led to the creating of the term 'binge-watching'.

According to the Oxford Dictionaries binge-watching is "watch[ing] multiple episodes of a television program in rapid succession, typically by means of DVDs or digital streaming." Dictionary.com has a similar definition of binge-watching: "To watch (multiple videos, episodes of a

TV show, etc.) in one sitting or over a short period of time." Walton-Pattison, Dombrowski, & Presseau define binge-watching as watching several/multiple episodes of the same series in one sitting (2016). Netflix itself defines binge-watching as consuming a minimum of two episodes in one sitting, and added that, across demographics, the average of a session was 2.3 episodes which is "moderate behavior" (Feeney, 2014). Netflix users defined binge-watching as watching between 2-6 episodes of the same TV show in one sitting (Spangler, 2013). All the definitions have in common that the understanding of binge-watching is to watch at least more than two episodes of the same series in the same sitting. One problem of all these definitions is that it is not clear how long an episode has to be. Because when watching a comedy series, for instance “How I Met Your Mother”, that episode is much shorter than watching an episode of the series “House of Cards”. Another problem is with the term “binge-watching” itself. In general ‘binge’ is seen as negative behavior. It is associated with behaviors like binge-eating and binge-drinking (Pierce-Grove, 2017). However, it is not clear yet if this phenomenon exists for television-watching behavior.

As the last statement already indicates, binge-watching as a behavior is often assumed to have negative consequences for health. Both physical and psychological consequences of binge-watching behavior have been suggested. First of all it is to mention that there are not many studies done who cover the effects of binge-watching on the physiological well-being. But researches that focus on excessive television watching exist and that behavior is similar to binge-watching. It is found that viewers have the habit to consume snacks and unhealthy drinks during TV-watching (Van Den Bulck, 2000). Boulos et al. (2012) have found a direct association between watching hours of television and body weight. This can be explained by the sedentary behavior that occurs when watching TV which results into a higher BMI and a possible obesity (Anderson, Bartlett & Cheskin, 1998; Wallton-Pattison, Dombrowski & Pressau 2016). Next to weight problems binge-watching behavior has also consequences on sleeping. People indicated that they feel the next day tired when they binge-watch before going to bed (Chan, 2014). Oberschmidt (2017) found out that the frequency of binge-watching behavior had no influence on sleep quality or quantity. However, the factors binge-watching during nighttime and binge-watching with a friend lowered the quantity and quality of sleep.

On the possible psychological effects of binge-watching behavior not much research has been done. In the quantitative survey from Sung, Kang, & Wei-Na (2015) it was discovered that the more lonely and depressed participants were, the more likely they were to show binge-watching behavior. It was find out that the participants binge-watch to get away from negative feelings. These findings are congruent with Wheeler's results (2015). She found positive correlations between binge-watching behavior and depression and loneliness. She also investigated the associations between binge-watching and psychological well-being. The results showed a significant relationship between those two variables. Lastly, the study of Ahmed (2017) showed also that binge-watching and depression are positively related, however there was no correlation between binge-watching behavior and loneliness. Because of the lack of research on psychological consequences of binge-watching behavior and its contradictory findings this study will have a closer look at mental well-being and binge-watching.

Theory of Planned Behavior

Besides the consequences of binge-watching, it is also little known about possible antecedents of binge-watching. There are only a few studies who have examined binge-watching using established theories and theoretical frameworks (Walton-Pattison, Dombrowski, & Presseau, 2016; Shim & Kim, 2018). In this study the Theory of Planned Behavior [TPB] by Ajzen (1991) is proposed to predict binge-watching behavior. TPB is found to be predictive of a wide range of (health) behaviors (Ajzen, 1985, 1987, 1991). In the TPB, behavior is determined by the intention to perform a certain behavior. Intention itself is determined by three social-cognitive constructs: attitude towards the behavior, subjective norm regarding the behavior and perceived behavioral control. Attitude is the general evaluation of a particular behavior shaped by positive as well as negative information (beliefs, opinions) regarding that behavior and its consequences. Subjective norm is defined as the perceived expectations of significant others to behave (or not to behave) in a certain way. The third determinant perceived behavioral control is the perception of oneself of how capable one is to act a particular behavior out.

Next to the main constructs, there are also the variables descriptive norm and social pressure in the TPB as predictors added. Social pressure is having the feeling that relevant others want one to

behave in a certain way; descriptive norm is the perceptions of what important others themselves do. The TPB has been already studied for screen based behavior which is similar to binge-watching. In the study of Haagsma, King, Pieterse & Peters (2012) problematic game use was investigated with TPB. The main findings were that TPB with significant variables subjective norm, perceived behavioral control and descriptive norm can explain the intention to game, but TPB failed in predicting that kind of behavior. Only the TPB construct perceived behavioral control seemed to be usable for predicting problematic game use behavior.

Although the Theory of Planned Behavior seems to be a valid model to predict and explain binge-watching behavior, its predictive value has limitations. TPB's range to predict certain behavior is from 27% to 39% of the variance in intention and behavior (Armitage & Conner, 2001). Its theoretical foundations are determined in conscious decision making. This means that the process to develop/form an intention is a conscious process based on deciding consciously. It also consequently assumes that the performed behavior is occurred by conscious decision making. However, not every behavior underlies conscious processes. There are thoughts and acts that undergo unconscious processes (Lewicki & Hill, 1987). Therefore it is decided to add personality traits and Compensatory Health Beliefs to explain binge-watching behavior.

Personality Traits

Personality seems to be a crucial factor to predict binge-watching (Sung, Kang, & Wei-Na, 2015; Orosz, Vallerand, Bőthe, Tóth-Király, & Paskuj, 2016; Shim & Kim, 2018). The personality trait impulsivity has been found to influence series watching behavior (Orosz, Vallerand, Bőthe, Tóth-Király, & Paskuj, 2016). Impulsive is someone who is unable to control its behavior or emotions and takes risk without thinking through. In the study of Orosz et al. (2016) impulsivity was associated with obsessive passion for screen-based behavior. Obsessive passion was a predictor of problematic screen-based activity outcomes. In another study it was found that people who have less control about their behavior tend to binge-watch (Sung, Kang, & Wei-Na, 2015).

Next to impulsivity, the personality trait sensation seeking can account for binge-watching behavior (Shim & Kim, 2018). Sensation seeking is the tendency to seek for new or complex

sensations and experiences even though it could bring physical or social consequences. In the study of Shim & Kim (2018) it is found that sensation seeking positively correlated with binge-watching. That means that high sensation seekers were more likely to perform binge-watching behavior.

As the studies showed could both personality traits, impulsivity and sensation seeking, explain binge-watching behavior. Therefore it will be investigated in this study if impulsivity and sensation seeking can add explanatory value to the theory of planned behavior.

Compensatory Health Beliefs

The last potential predictor that will be examined will be a model that has also been used to explain other addictive behaviors (Radtke, Scholz, Keller, Knäuper, & Hornung, 2011): the Compensatory Health Beliefs model. Compensatory Health Beliefs (CHBs) refer to beliefs that people compensate or 'neutralize' bad behavior, by engaging in positive, good actions (Rabiau, Knäuper, & Miquelon, 2006). This means for instance that when you decide that you can eat a whole pack of ice-cream because you are planning to sport at least an hour that day. These beliefs have the characteristic to be accurate, partially accurate, or inaccurate. The problem is therefore that having CHBs the actions been taken to make up for that bad behavior related to CHBs, do not completely compensate the negative consequences of CHBs. Also problematic with CHBs is that the positive compensation might not occur at all (Radtke, Scholz, Keller, Perren, & Hornung, 2013), e.g. the person eats an ice-cream, but does not actually exercise that day. Oberschmidt (2017) and Prinsen (2017) have already found a positive relation between CHBs for binge-watching and binge-watching frequency ($r = .217$, $p < .05$). This study will also look if CHBs for binge-watching correlates with the frequency of binge-watching predicting that the more someone has CHBs the more he or she tends to binge-watch. Also it will be studied if CHBs and the personality traits can add explanatory value to the prediction of binge-watching behavior since the TPB has limited explanatory value. Finally it will be analyzed if and how mental well-being is affected by binge-watching.

Until now there is a lack of research about how binge-watching influences health and well-being (Davis, 2016), and what factors predict binge-watching. The aim of this study is to investigate

the role of CHBs in binge-watching, which determinants explain binge-watching and the effects of binge-watching on mental well-being. This leads to the following hypotheses:

1. Binge-watching is negatively related with mental well-being.
2. Impulsivity and sensation seeking are positively related with binge-watching.
3. CHBs for binge-watching are positively related with binge-watching.
4. TPB for binge-watching is positively related with binge-watching.
5. CHBs for binge-watching are negatively related with mental well-being.
6. Impulsivity and sensation seeking add explanatory value to the Theory of Planned Behavior.
7. BW CHBs add explanatory value to the Theory of Planned Behavior.
8. The effect of BW CHBs on mental well-being is mediated by binge-watching.

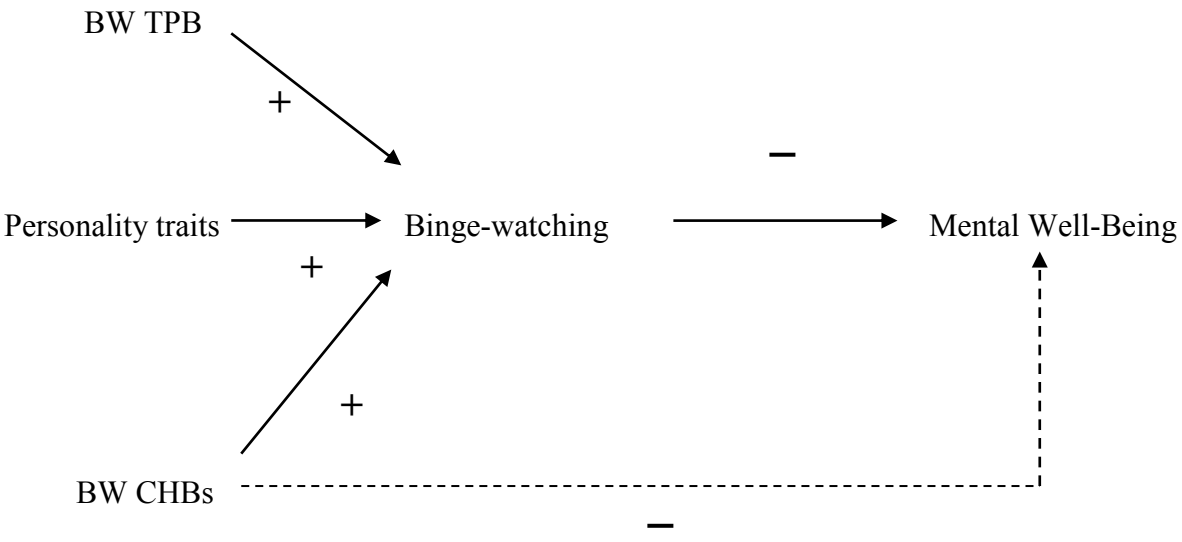

Figure 1. Scheme of the expected relationship between Compensatory Health Beliefs, Theory of Planned Behavior, personality traits, binge-watching and mental well-being.

Note: ——— *=correlation;* - - - - - - *=mediation.*

Method

Participants

The target group for this cross-sectional survey study were young adults between 18-35 years old. There are two criterions that had to be fulfilled in order to participate in the study. One inclusion criterion was that the participants had to be able to understand English, the other is to agree with the informed consent.

Between November 7 and November 24, 2017, respondents were recruited personally as well as through the test-person-system at the University of Twente (SONA). SONA is a platform where students of the studies psychology and communication sciences can participate in other student's research and receive participation credit. Next to those both rescources, social media like Facebook and WhatsApp were used to ask the acquaintances of the researcher to take part in the study.

186 participants participated in this study, but only the data of 172 participants (92.47%) was used. These participants had completed the survey, thus filled in the whole questionnaire, and had no unrealistic outcomes on binge-watching frequency. The age of participants ranged from 18 to 34 years, with an average age of 20.97 (SD=2.47). 32 (18.6%) were male, the other 140 (81.4%) female. Most participants were students (N=160, 93.0%), some employed (N=9, 5.2%), 2 (1.2%) unemployed, and one (0.6 %) participant marked 'other' as its employment status.

Study Design

A cross-sectional online correlational survey design was employed. Qualtrics Survey Software was used to create the survey (www.qualtrics.com). The variables TPB, personality traits, CHBs, binge-watching behavior and mental well-being were measured using previously validated scales. The whole survey was conducted in English.

Materials

The survey consisted of a number of questionnaires. These questionnaires were the Compensatory Health Beliefs scale for binge-watching, Theory of Planned Behavior scale for binge-watching, the

Substance Use Risk Profile Scale, the Mental Health Continuum Scale as well as the Walton-Pattison et al. (2016) variables for measuring binge-watching.

CHBs for binge-watching

The scale about CHBs related to binge-watching was used to measure the Compensatory Health Beliefs about binge-watching. The scale was developed by Oberschmidt (2017) and Prinsen (2017). They used the existing CHB scale (Rabia et al., 2006) and transformed the items to be binge-watching related Compensatory Health Beliefs. The researchers added eight statements to the CHBs scale related to binge-watching which have to be rated by the participant on a five-point Likert scale (not at all – a little – somewhat – quite a bit – very much). An example of a statement about CHB related to binge-watching is: 'It's okay to watch multiple episodes of a series if I worked hard that day.' The CHBs scale on binge-watching measuring only one factor showed great validity. All eight items together had a sufficiently high Cronbach's alpha of 0.82.

Construct of TPB for binge-watching

To investigate TPB and binge-watching, questions about TPB related to binge-watching were formulated and then added. Based on the existing Twente model of Binge Drinking (Pieterse, Boer & Van Wersch, 2010), the items about intention, attitude, self-efficacy, descriptive norm, social pressure and subjective norm were transformed into items that relate to binge-watching instead of binge-drinking. The adapted TPB constructs of the Twente model of Binge Drinking had to be checked for reliability. The three items about intention had a Cronbach's alpha of 0.73, the construct attention with four items had a Cronbach's alpha of 0.85 and the two items about subjective norm an alpha of 0.44. Self-efficacy measured with five items had an alpha of 0.67. These intern consistency reliabilities are relatively good.

Substance Use Risk Profile Scale

Personality was measured using the Substance Use Risk Profile Scale (SURP) (Woicik, Stewart, Robert & Conrod, 2009). This scale can be used to measure four different personality traits ('impulsivity', 'sensation seeking', 'hopelessness', 'anxiety sensivity') that have been found to be associated with substance use. It consists of 23 statements where participants are asked to tick a box on a 4-point Likert scale ranging from: 'Strongly disagree', 'Disagree', 'Agree' and 'Strongly agree'. It

is found that the internal reliability for the subscale impulsivity consisting of five item is 0.53, for sensation seeking with six items 0.7, for hopelessness with seven items 0.77 and for anxiety sensitivity consisting of five items 0.61.

Mental Health Continuum Scale

Mental well-being was investigated by using the Mental Health Continuum Short Form (Keyes, 2009). This scale can be used to measure three different dimensions of well-being ('emotional well-being', 'psychological well-being', 'social well-being') by asking participants to rate 15 items. In this study a Cronbach's alpha of 0.89 for the total short MHC was found, for the subscale emotional well-being with three items an alpha of 0.87, for social well-being consisting of six items 0.79 and for psychological well-being with six items a Cronbach's alpha of 0.80. These findings are similar to already existing studies which used the Mental Health Continuum Short Form (Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011; Robitschek & Keyes, 2006, 2009).

Binge-watching

Binge-watching frequency was measured by asking the participants on how many days, in the past seven days, they watched more than two episodes of the same TV series in the same sitting (one immediately after the other). Also it was asked how many hours they had watched in the last sitting and how many episodes. These three questions were taken from the study of Wallton-Pattison et al. (2016). In this study, binge-watching frequency was measured by the first question and binge-watching quantity by multiplying the amount of days that people watched more than two consecutive episodes with the amount of episodes that they watched.

Ethical Considerations

The study was approved by the local ethics committee at the University of Twente, faculty of Behavioural, Management and Social sciences. Participants were invited through social media and Sona System to take part in the online survey. Before starting the survey participants had to give informed consent. They received information about their rights in the study and also a short explanation about the study and its goal. Further, they were instructed how to answer the questions. It was asked to be honest when filling in the questionnaire. When participants went to answer the

questionnaire, they automatically agreed with the informed consent, and confirmed that they had understood the study's purpose. After filling in the survey participants had the choice to exclude their data from the study by informing the researcher. During the process of working with the data was anonymity of the participant always respected and granted. Participants had also the option to leave their email address at the end of the survey if they wanted to know the results of the study. It was estimated that participants would take 20 minutes to complete the survey, but participants used less time in practice.

Analysis

First, 11 participants were excluded who did not complete the whole survey, which left a total of 175 respondents. For analyses another exclusion criterion was when participants had indicated that they watched for almost or longer than two days on their last binge-watching session. This seemed unrealistic, therefore 3 more respondents were excluded which made a total of 172 respondents. The dataset of these respondents was used to execute analyses.

In order to analyze the data, it was first looked if the variables were normally distributed. According to the histograms executed for each variable it could be determined that there was a sufficiently normal distribution present. Next, the analyses for testing the hypotheses were performed. Hypotheses 1 through 5 were tested by bivariate Pearson´s correlation analyses. Hypothesis 1 tested the correlation between binge-watching and mental well-being. Hypothesis 2 between personality traits and binge-watching, hypothesis 3 between CHBs related to binge-watching and binge-watching and hypothesis 4 between BW TPB constructs and binge-watching. Hypothesis 5 tested the correlation between CHBs and the subscales of mental well-being.

After that, a hierarchical regression analysis was done to find out whether personality traits and BW CHBs add explanatory value to BW TPB (hypotheses 6 and 7). For this analysis binge-watching frequency was the dependent variable and the other constructs independent variables. The same analysis was done again, but this time with binge-watching quantity as dependent variable.

Lastly, hypothesis 8 was tested by a mediation analysis (Baron & Kenny, 1986). BW CHBs was the independent variable, mental well-being the dependent variable and binge-watching the mediator. Four regression analyses were executed in order to test this hypothesis. First with dependent variable BW CHBs and independent variable mental well-being, then with BW CHBs and binge-watching, thereafter mental well-being and binge-watching, and finally mental well-being with two independent variables: BW CHBs and binge-watching. According to Baron & Kenny (1986) mediation exists if the three following conditions are met:

1) Variations in BW CHBs significantly account for variations in binge-watching.

2) Variations in binge-watching significantly account for variations in mental well-being.

3) When path 1) and path 2) are controlled, a previously significant relation between BW CHBs and mental well-being is reduced or no longer significant, with the strongest demonstration of mediation occurring when the path from BW CHBs to mental well-being is zero.

Results

Prevalence of binge-watching

On average, participants indicated watching more than two episodes of a series on 3.38 days in the past week (SD= 1.82). Almost 80% of the sample binge-watched at least once per week (16.3%). The average amount of episodes watched in the last sitting was 4.00 (SD= 2.14). Binge-watching quantity, or the total number of episodes watched in the last week, varied greatly between participants (M= 14.23; SD= 12.24): Around a third of participants had viewed 8 or less episodes (36.6%), some participants had viewed between 40 and 65 episodes. One participant even viewed 65 episodes.

Scoring of mental well-being

The average total score of mental well-being was 60.90 (SD= 10.79). For the subscale emotional well-being was the average score of the population 13.75 (SD= 2.57), for social well-being 21.08 (SD= 5.37) and for the subscale psychological well-being 26.08 (SD= 4.75).

Bivariate associations between binge-watching, its antecedents and mental well-being

Hypothesis 1 indicated that binge-watching frequency and quantity of binge-watching would be negatively related with mental well-being. The results of the bivariate Pearson's correlation analysis demonstrated that there was no significant correlation ($r = -0.015$, $p = 0.847$) between binge-watching quantity and total mental well-being, but there was a significant correlation found for frequency of binge-watching ($r = 0.170$, $p = 0.026$). Against expectations, the relationship between the frequency of binge-watching and mental well-being was positive. Looking individually at the subscales of the MHC showed that frequency of binge-watching correlated positively with psychological well-being ($r = 0.214$, $p = 0.005$) only. This was not found for the quantity of binge-watching.

The personality traits impulsivity and sensation seeking were not related with binge-watching frequency. But there was a positive significant correlation between impulsivity and binge-watching quantity ($r = 0.190$, $p = 0.012$) which partly supports hypothesis 2. The other personality traits, anxiety sensitivity and hopelessness, had no relation to either frequency or quantity of binge-watching.

The results of the bivariate Pearson's correlation analysis confirmed hypothesis 3. CHBs for binge-watching positively correlated with binge-watching frequency ($r = 0.165$, $p = 0.030$) as well as with quantity ($r = 0.255$, $p = 0.001$). The correlation between BW CHBs and binge-watching quantity is stronger than the correlation between BW CHBs and binge-watching frequency.

The results confirmed hypothesis 4 as well. When taking a closer look at the constructs of TPB, it was found that intention to not binge-watch correlated negatively with binge-watching frequency ($r = -0.402$, $p < 0.001$) as well as with binge-watching quantity ($r = -0.314$, $p < 0.001$). The correlation between attitude towards binge-watching and frequency ($r = 0.352$, $p < 0.001$) and quantity ($r = 0.339$, $p < 0.001$) of binge-watching was positive. The variable self-efficacy was also positively related to binge-watching frequency ($r = 0.276$, $p < 0.001$) and quantity ($r = 0.309$, $p < 0.001$). The strongest positive correlation was found between descriptive norm and binge-watching ($r = 0.384$, $p < 0.001$). The variables subjective norm and social pressure had no significant correlation with binge-watching.

At last there was no significant relation found between CHBs for binge-watching and total mental well-being ($r= 0.007$, $N=175$, $p=0.925$). Also each subscale of mental health individually showed no correlation with BW CHBs, hypothesis 5 can be therefore rejected.

Table 1

Pearson correlation table of the variables

		2	3	4	5	6	7	8	9	10	11	12	13
1	CHB Binge-watching	0.098	0.071	-0.250**	0.279**	0.270**	-0.110	0.044	0.102	0.165*	0.255*	0.012	0.007
2	Impulsivity		0.108	0.063	0.042	0.029	0.084	0.044	-0.045	0.115	0.190*	-0.148	-0.110
3	Sensation seeking			-0.060	0.094	-0.021	-0.067	0.092	0.023	-0.027	0.013	-0.076	-0.021
4	Intention				-0.472**	-0.462**	0.149	-0.285**	0.012	-0.402**	-0.314**	-0.163*	-0.190*
5	Attitude					0.338**	-0.297**	0.197**	-0.050	0.352**	0.339**	0.032	0.096
6	Perceived behavioral control						0.133	0.078	0.071	0.276**	0.309**	-0.049	-0.067
7	Subjective norm							-0.107	0.000	-0.023	0.029	-0.113	-0.130
8	Descriptive norm								0.221**	0.384**	0.223**	0.175*	0.218*
9	Social pressure									0.015	0.097	0.179*	0.087
10	Binge-watching frequency										0.732**	0.170*	0.214**
11	Binge-watching quantity											-0.015	0.055
12	Mental well-being												0.862**
13	Psychological well-being												-

* p<0.05
**p<0.01

Hierarchical regression analyses on binge-watching

A hierarchical regression analysis with binge-watching frequency was executed. The analysis was conducted with three models. The first model consisted of the independent variables of TPB. These variables statistically significantly predicted binge-watching frequency ($F(5,166) = 11.680$, $p < 0.001$, $R^2 = .260$). In the second model the personality traits sensation seeking and impulsivity were added. The analysis showed that the extended model added statistically significant explanatory value to the Theory of Planned Behavior ($F(7, 164) = 8.796$, $p < 0.001$, $R^2 = 0.273$). But not all variables added statistically significance to the prediction, $p < 0.05$. For frequency of binge-watching only the TPB constructs attitude, perceived behavioral control and descriptive norm did. The extended model explained 27.3% of the variance of binge-watching frequency. The third model added the Compensatory Health Beliefs. This model added statistically significant explanatory value to the TPB as well ($F(8,163) = 7.750$, $p < 0.001$). The analysis showed that 27.3% of the variance of binge-watching frequency can be explained by this model. The variables as in model 2 added statistically significance to the prediction of binge-watching behavior, $p < 0.05$. If intention is added as a fourth model the explanatory value increased to 30.2%. This result showed that intention added statistically significant explanatory value to the TPB ($F(9,162) = 7.797$, $p < 0.001$).

Table 2

Hierarchical regression analysis outcome on binge-watching frequency

		Model 1		Model 2		Model 3	
		ß	**p-value**	**ß**	**p-value**	**ß**	**p-value**
Block 1	**Attitude**	0.245	0.002	0.284	0.002	0.237	0.003
	Subjective norm	0.065	0.030	0.053	0.464	0.059	0.424
	Perceived behavioral control	0.162	0.002	0.158	0.034	0.146	0.054
	Descriptive norm	0.343	0.000	0.344	0.000	0.347	0.000
	Social pressure	-0.060	0.384	-0.054	0.433	-0.060	0.387
Block 2	**Impulsivity**			0.087	0.201	0.082	0.232
	Sensation seeking			-0.083	0.219	-0.086	0.208
Block 3	**CHB Binge-watching**					0.055	0.446
R square		0.260**			0.273**		0.276**

** p<0.01

Another hierarchical analysis was carried out with binge-watching quantity. The three executed models had the same constellation of variables as the models with binge-watching frequency. The main findings were that each model statistically significant predicted binge-watching quantity. The first model explained 19.5% of the variance of binge-watching quantity, the second model 22.3%, the third 23.7%, and if intention is added, this model explained 24.7%. The analysis showed also that both models, the second ($F(7,164) = 6.716$, $p < 0.001$) and the third ($F(8,163) = 6.330$, $p < 0.001$), added statistically significant explanatory value to the TPB. But not all variables added statistically significance to the prediction, $p < 0.05$. In the second model only the variables attitude, perceived behavioral control and impulsivity did. The third model had the same statistically significant variables including descriptive norm.

Ultimately these analyses showed that CHBs related to binge-watching and the personality traits impulsivity and sensation seeking added explanatory value predicting binge-watching behavior.

Both determinants added explanatory value to the Theory of Planned Behavior. Therefore hypotheses 6 and 7 were confirmed.

Table 3

Hierarchical regression analysis outcome on binge-watching quantity

		Model 1		**Model 2**		**Model 3**	
		ß	**p-value**	**ß**	**p-value**	**ß**	**p-value**
Block 1	**Attitude**	0.282	0.001	0.275	0.001	0.251	0.002
	Subjective norm	0.105	0.169	0.085	0.259	0.097	0.197
	Perceived behavioral control	0.184	0.001	0.183	0.017	0.156	0.046
	Descriptive norm	0.149	0.043	0.143	0.051	0.149	0.040
	Social pressure	0.065	0.367	0.075	0.296	0.847	0.398
Block 2	**Impulsivity**			0.167	0.018	0.155	0.027
	Sensation seeking			-0.036	0.606	-0.600	0.549
Block 3	**CHB Binge-watching**					0.129	0.083
R square		0.195**			0.223**		0.237**

** p<0.01

Mediation of binge-watching

Different mediation analyses were executed as described ahead. It was assumed that there is significant positive relationship between the independent variable BW CHBs and the dependent variable mental well being. However, the correlation analysis showed that BW CHBs is not related to mental well-being (r= 0.012, p= 0.871) or to the other subscales of mental well-being. The follow up regression analysis demonstrated consequently also no effect of BW CHBs on mental well-being (p= 0.871). Therefore the main criterion for testing mediation in the first place was not present.

Table 4

Summary of Regression Analysis for predicting BW CHBs for mental well-being (N=172)

		Unstandardized Coefficients		Standardized Coefficients		
Model		**B**	**SE**	**ß**	**t**	**p-value**
1	**(Constant)**	60.365	3.411		17.697	0.000
	CHB Binge-watching	0.022	0.137	0.012	0.162	0.871

a. Dependent Variable: Mental well-being

The second condition of mediation was however met: A significant positive correlation between BW CHBs and binge-watching frequency was found (p= 0.030) as mentioned in the paragraph before. Also the third condition for an existing mediation was fulfilled. There must be a significant relationship between the mediating variable and the dependent variable. The results showed that binge-watching frequency positively correlated with mental well-being (p= 0.026).

Table 5

Summary of Regression Analysis for predicting binge-watching for mental well-being (N=172)

		Unstandardized Coefficients		Standardized Coefficients		
Model		**B**	**SE**	**ß**	**t**	**p-value**
1	**(Constant)**	57.494	1.718		33.471	0.000
	Binge-watching frequency	1.009	0.448	0.170	2.252	0.026

a. Dependent Variable: Mental well-being

Lastly, a multiple regression analysis was executed to test if the mediator changes the effect from BW CHBs on mental well-being. As it can be seen in the table 6, the ß coefficient of the relation between BW CHBs and well being is -0.016. Before adding binge-watching frequency, the coefficient was positive (ß= 0.012). It could be that the first criterion of mediation did not occur because of possible suppression effects. However, there is no mediation because the first criterion is not met. Therefore hypothesis 8 was rejected.

Table 6

Coefficients of regression analysis with BW CHBs, binge-watching and mental well-being (N=172)

		Unstandardized Coefficients		**Standardized Coefficients**		
Model		**B**	**SE**	**ß**	**t**	**p-value**
1	**(Constant)**	58.138	3.513		16.547	0.000
	CHB Binge-watching	-0.029	0.137	-0.016	-0.210	0.834
	Binge-watching frequency	1.025	0.455	0.173	2.250	0.026

a. Dependent Variable: Mental well-being

Discussion

The aim of this cross-sectional study was to investigate associations between Compensatory Health Beliefs, binge-watching and mental well-being in a population of young adults. Furthermore it was aimed to see if next to the Theory of Planned Behavior the determinants impulsivity and sensation seeking and BW CHBs can add explanatory value explaining binge-watching behavior. The first finding of this study was that binge-watching behavior was generally not associated with mental well-being, except for a weak positive association between binge-watching and psychological well-being. Secondly, it was found that the determinants BW CHBs, BW TPB and personality traits are related to binge-watching and together explain 23.7% variance of binge-watching behavior. However, CHBs related to binge-watching was not significant to the prediction, but impulsivity was. Lastly, there was no mediation of the relation between BW CHBs and mental well-being by binge-watching frequency discovered.

In this study the prevelance of binge-watching was moderately high. Almost 80% of the sample binge-watched at least once per week. This finding is similar to the study of Oberschmidt (2017) who had found that 77% of the participants binge-watched. It seems that binge-watching is not a scarcity in young adults of which most of them were students. Maybe young adults with a job would have shown lower results of binge-watching. They probably have less to time perform that behavior.

Because of the high prevelance of binge-watching in this study it could be assumed to find a negative correlation between binge-watching and mental well-being. However, this hypothesis was not confirmed. It was surprising that binge-watching was not associated with general mental well-being, but a positive correlation between binge-watching and psychological well-being was found. The subscale psychological well-being consists of items about self-acceptance, autonomy, purpose in life and having positive relations with others. So people who frequently binge-watch seem to have greater expectations towards life, feel good about themselves and have social skills. Next to psychological well-being, there were also the other both subscales emotional and social well-being who had no correlation with binge-watching frequency or quantity. These findings are not congruent with existing studies. Other studies found positive associations between binge-watching and mental health issues like depression and loneliness (Sung, Kang & Wei-Na, 2015; Ahmed, 2017). One possible explanation

of not suffering mentally is that young adults neutralize this binge-watching behavior with social activities such as meeting friends. Another possible explanation could be that a lot of the young adults who watch excessive series, do this not on their own. Maybe they have company and share this activity with a friend together. In a Dutch survey it was found that more than a third of the participants prefer to watch with another person (DVJ Insights, 2014). This supports the finding of this study that descriptive norm had the strongest correlation with binge-watching ($r = 0.384$). This suggests that binge-watching is maybe more a social activity, at least in this sample.

The positive correlation between BW CHBs and binge-watching frequency was found before by Oberschmidt (2017) and Prinsen (2017). They discovered a slightly stronger correlation ($r > 0.200$) than it was found in this study. CHBs for binge-watching were however found to be not an independent predictor of binge-watching behavior. Together with BW TPB and personality traits it was shown that all those variables collectively explained 23.7% variance of binge-watching. BW CHBs added only 1.4% when included to the other determinants. Further, there was no correlation between CHBs related to binge-watching and mental well-being found. A possible explanation of this finding can be that other factors reversed this relation. As seen in the mediation analysis, a path from BW CHBs to binge-watching behavior did exist and also the path from binge-watching to mental well-being. Maybe the effect of BW CHBs for mental well-being is intervened/disrupted by binge-watching and subsequently a so called suppression effect has caused this not present correlation between BW CHBs and mental well-being. It is possible that also other factors suppressed this relationship. The social aspect as mentioned, before which has not been taking account into this study, might be responsible for showing no correlation. It could be that the person who binge-watches compensates this behavior with a lot of social activities. Therefore for further research it is recommended to add the variables social environment and activities. For instance it could be questions asked about how often someone is meeting friends in a week.

The antecedents impulsivity and sensation seeking were not related to binge-watching frequency. The personality trait impulsivity did however show a small significant correlation with binge-watching quantity. This finding is supported by the study of Orosz et al. (2016) who found also a positive relationship between those variables. Sensation seeking did not correlate with binge-

watching although this correlation was in the study of Shim & Kim (2018) significant. The personality traits did also add explanatory value to TPB ($R^2 = 0.223$), but only a small one by 2.8%. Further, impulsivity was a significant independent predictor of binge-watching quantity ($p < 0.05$).

The findings of the Theory of Planned Behavior variables and of binge-watching frequency are partly consistent with the study of Haagsma et. al (2012) who applied the theory of planned behavior to problematic game use. As in the study about gaming it was found that self-efficacy and descriptive norm positively correlated with binge-watching. Next to these constructs, attitude also had a positive impact on binge-watching behavior in our study which was not the case in their study. Another difference is also that subjective norm was not associated with binge-watching. The negative correlation between intention and binge-watching was expected (because intention is measured with watching less than two episodes). In the study of Haagsma et al. (2012), self-efficacy was found to be the best predictor. Looking at the TPB constructs, the variance in binge-watching behavior was best explained by descriptive norms. This could suggest that binge-watching is a social activity.

Limitations

A general possible explanation why some assumed correlations with binge-watching are not confirmed could be that the questions used for binge-watching behavior cover not all the aspects of binge-watching. Particularly the question about on how many days in the last week someone watches more than two episodes of the same TV series in the same sitting (one immediately after the other) may not fully measure the frequency of binge-watching. The participants answer this question on the basis of the recent last week. It could be that they binge-watched less in the past week because they had a busy schedule. Possible is also the opposite that they watched much more series because they had free time.

Another problem is also that it is not truly covered how much of a binge-watcher someone is. Multiplying the frequency question with the question how many episodes someone watches in the last sitting does not tell how many episodes a person watches on a regularly basis. If the last sitting consisted of watching five episodes after each other, does not mean that this person usually watches this many episodes. It is possible that this person tends to binge-watch only three episodes. Therefore it is recommended to develop the questions about binge-watching further.

Although we have found correlations, these correlations were moderately weak. To see if BW CHBs may correlate with mental well-being, how the binge-watching and mental well-being correlation might get stronger or if other causal relations occur, a longitudinal study could give answers and new insights.

Finally, in our sample were mostly students who have more time to binge-watch than adults with a job. The findings were probably slightly different if we would investigate participants who have a job or who are older than 35 years. Because our diversity of our sample's characteristics were restricted, the findings cannot be generalized to the population.

Recommendations

Recommendations for next research would be to add new questions to the concept of binge-watching behavior. Now the questions focus on the past seven days binge-watching, the hours spend to binge-watch and how many episodes watched in the last sitting. However, the average pattern of behavior could change from week to week. By asking the participants on how many days they watch more than two episodes in an ordinary week the usual binge-watching behavior may be better covered. Next to defining binge-watching behavior, it should be looked at the social activities of the person binge-watching. This could explain why binge-watching behavior is not negatively related to mental well-being. Questions can be asked about the social life of the participant. It can be asked if participants have regularly contact to friends and how this will look like (a telephone call, meeting for an hour, spending the whole afternoon together). Next, it is also interesting to see if watching alone or with a friend has an effect on mental well-being. Finally, it is recommended to explore other determinants for binge-watching. As already described was only a small explained variation in binge-watching behavior found. Since binge-watching seems to be a social activity it could be that social factors might influence binge-watching behavior. This should be tested in the context of binge-watching.

To sum up, binge-watching is associated with Compensatory Health Beliefs related to binge-watching, Theory of Planned Behavior related to binge-watching and the personality trait impulsivity. However, the character trait sensation seeking had no influence on binge-watching. Furthermore,

binge-watching had a positive effect on psychological well-being. Mental well-being was not found to be associated with BW CHBs. Finally, there are still possible other determinants and confounders that have not been investigated with to binge-watching.

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