VoD Watching: An Experience Sampling Study on Motivations and Perceived Stress

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Bachelor Thesis

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June 28, 2021

Abstract

Introduction. Streaming multiple TV show episodes on Video-on-Demand (VoD) platforms such as Netflix and Amazon Prime is becoming increasingly popular. Existing literature points out that people's motivations to watch have an impact on their extent of VoD watching. Also, stress-related health issues could be influenced by the individual's reasons to use VoD services. Therefore, the current study further examined the temporal relation between the amount of VoD watching and stress over time and the potential moderating role of motivations for watching.

Method. This experience sampling method (ESM) study had a sample size of 74 (M_{age} = 22.96; SD_{age} = 5.51; range from 20 to 60 years; 17.6% male, 82.4% female). The participants used the Ethica mobile application for 14 days to administer two daily measurements about VoD watching behaviour the previous day, motivations for watching and momentary stress levels. The data was analysed using a series of linear mixed models (LMMs).

Results. Problematic motivations, such as loneliness or escape from reality, were significantly associated with a higher number of hours watched afterwards (β = .37; SE = .03; $p < .001$). Also, there was a significant negative correlation between stress in the morning and hours watched that day (β = -.09; SE = .04; p = .018). However, there was no significant correlation between the hours watched and stress in the morning on the next day. For the correlation between stress in the evening and hours watched, there was no significant effect found for either the same day or the next day. Motivation for watching moderated the relationship between hours watched and the stress levels the next morning significantly (β = -.14; SE = .06; p = .024). If the participant's motivation for watching was unproblematic, more VoD watching was associated with lower stress levels the next morning. Also, more stress in the morning was associated with fewer watching hours that day if a problematic motivation was present (β = -.08; SE = .03; p = .006). There was no significant moderating effect of motivation for stress in the evening and hours watched.

Discussion. VoD watching could be predicted both by the individual's motivation and stress level in the morning. However, there was no significant effect between watching hours and stress levels the day after unless motivation was introduced as a moderator. In future studies, a more heterogeneous sample population should be targeted and more daily assessments should be conducted to measure stress levels more precisely related to VoD watching behaviour.

Keywords: VoD watching, Binge-watching, Stress, Motivation

Table of Contents

Introduction

Watching multiple episodes of a TV show in one sitting is becoming increasingly popular. Streaming platforms such as Netflix, HBO, Hulu, Amazon Prime, Disney+, and Apple TV are affordable and accessible to a wide range of users and their content is available on-demand. Furthermore, entire seasons are released at once instead of new episodes on a weekly basis. Altogether, those factors facilitate binge-watching, a practice defined by Netflix (2013) as watching two to six episodes of a TV show in one sitting. Netflix (2013) found that 61% of their participants binge-watched regularly and 73% of those indicated positive feelings towards that behaviour. Especially Gen-Xers and Millennials binge-watch TV shows on Netflix (CivicScience, 2020). Although the practice to binge-watch in the form of watching multiple episodes in TV marathons, VHS or DVD already existed before the rise of streaming platforms (Samuel, 2017; Conlin, 2015), its increasing prevalence due to on-demand watching has also increased scientific interest in its consequences and predictors (Flayelle et al., 2020).

While binge-watching can be considered a normal way of TV show consumption nowadays, there are some potentially negative consequences for the viewers (Pierce-Grove, 2017). Ahmed (2017) found a significant positive relationship between binge-watching and depression, but no correlation with loneliness. Other research suggests correlations to both depression and loneliness (Gangadharbatla et al., 2019; Sung et al., 2015; Tukachinsky & Eyal, 2018). Also, there are indications that binge-watching leads to goal conflicts and emotional distress in the forms of guilt and regret, which can influence individuals' well-being (Granow et al., 2018). Furthermore, binge-watching has been associated with reduced sleep quality, daytime fatigue, and more symptoms of insomnia (Exelmans, 2017). Those relationships were mediated by cognitive pre-sleep arousal. Additionally, Gangadharbatla et al. (2019) found that binge-watching negatively impacts school and work performance, and increases mental and physical exhaustion.

Despite the strong focus of most research on confirming the assumed potential negative effects of binge-watching (Flayelle et al., 2019), there is also literature on the potential positive effects. In fact, binge-watching is related to higher levels of enjoyment (Granow et al., 2018) and identification with characters of the TV show (Tukachinsky & Eyal, 2018). Additionally, "binge-watching provides new opportunities for self-determined forms of entertainment consumption and can positively influence media enjoyment and well-being through perceived autonomy" (Granow et al., 2018, p. 9). The consequences of binge-watching can thus evolve

in two directions. Firstly, it can pose a rewarding and pleasurable way to spend free time and positively impact an individual's well-being. Secondly, it can manifest in problematic, dysfunctional behaviour with negative consequences, including mental health conditions. Self-control has been shown to moderate the relationship between binge-watching and negative or positive consequences (Hofmann et al., 2016). A lack of self-control can lead to higher media use which conflicts with long-term goals and negatively affects wellbeing in the form of negative self-conscious emotions. However, individuals, who have enough self-control to use media to an extent that does not endanger their long-term goals, can benefit from the positive effects of media.

Another potential moderator of the association between binge-watching and mental outcomes, which has not received much attention yet, is the individual's motivation to binge-watch. Various motivations can lead the individual to binge-watch. The Uses and Gratifications (UG) framework has been used to describe media consumption in general and several studies established a link between this framework and motivations of binge-watching (Panda & Pandey, 2017; Pittman & Sheehan, 2015; Steiner & Xu, 2018). According to Elliott and Quattlebaum (1979), this framework describes the consumer's goals and needs that they are continually seeking to satisfy through various media activities. Since Rubin (2002) states that media use is driven by needs satisfaction, the outcome expectations of entertainment and enjoyment appear to motivate binge-watching (Pittman & Sheehan, 2015; Gangadharbatla et al., 2019). After extending the UG theory, Steiner and Xu (2018) found that improved viewing experience, catching up, relaxation, sense of competition, and cultural inclusion were the main motivations for binge-watching in their sample.

According to the UG framework, social engagement also plays a key role in explaining the motivations of binge-watching (Katz et al.,1973). Reasons to binge-watch can be making social connections, becoming part of a group, and feeling accepted by peers (Panda & Pandey, 2017). The Fear of Missing out (FOMO) is also a predictor for binge-watching as it connects to the aforementioned motivations to "catch up" and being culturally included (Conlin et al., 2016). Besides social motivations, binge-watching is also related to coping mechanisms, such as escaping reality and avoiding negative emotions or problems (Starosta et al., 2019). Furthermore, Starosta and Izydorczyk (2020) argue that individuals might use binge-watching as a form of emotional regulation. Other, more effective ways of coping with negative emotions can decrease since binge-watching often poses as people's preferred strategy (Panda & Pandey, 2017). Fictional characters can also become viewer's companions in solitude to help them cope

with loneliness (Starosta et al., 2019) as they form strong parasocial relationships with fictional characters (Erickson et al.,2019; Wheeler, 2015). Another type of motivation is to obtain knowledge and self-development by viewing a TV show.

There is emerging literature about the division between problematic and unproblematic motivations for binge-watching. People who binge-watch less often are more likely to be motivated by the entertainment factor (Sung et al., 2018). However, other motivations predicting more severe binge-watching are considered problematic. For instance, the motivation to pass time was correlated with high binge-watching frequency (Sung et al., 2018). Additionally, the motivation to escape from everyday life problems and coping with loneliness are driving problematic binge-watching behaviours in individuals (Starosta et al., 2019). Problematic and unproblematic motivations are often described as predictors for binge-watching and its frequency. However, they have not yet been examined as potential moderators of the association between binge-watching and mental health outcomes. Depending on the motivation, binge-watching could cause positive or negative mental health outcomes. Engaging in binge-watching for entertainment purposes might result in relaxation, while the motivation to escape from problems might cause emotional distress after watching. Since motivations could fluctuate daily in individuals, both positive and negative mental health outcomes could be triggered depending on the motivation present that day.

Therefore, there is a need for intensive longitudinal studies on the relationship between binge-watching and mental health outcomes since the existing cross-sectional surveys cannot take motivational changes into account. This lack of longitudinal studies poses a limitation of the current body of research on the motivations for and outcomes of binge-watching (Starosta & Izydorczyk, 2020). Since there are inconsistent results, for instance concerning the relationship between binge-watching and mental health, there is a need for longitudinal studies that take into account time-dependent variations in watching behaviour and mental health indicators.

The Experience Sampling Method (ESM) is a research design in which data is collected using repeated measurements over time while participants remain within their natural setting (Scollon et al., 2009). More specifically, ESM measures the patterning and variations of self-reported mental processes and daily activities (Csikszentmihalyi & Larson, 2014). The advantage of the ESM is that the individual's direct life experiences are measured. Thus, relationships between content and the context can be analysed (Hektner & Csikszentmihalyi, 2002). Using the ESM allows researchers to take into account time-varying motivations as a

context of binge-watching behaviour. Because it captures the participants' direct situational perception, ESM can also be used to assess the frequency and intensity of behaviours and feelings more accurately. Using this method could provide the opportunity to examine if problematic and unproblematic motivations of binge-watching influence a health-related concept, such as stress, differently.

Stress could be both a predictor and a consequence of binge-watching. Individuals tend to neglect duties and experience forms of emotional distress, such as guilt and regret because of their binge-watching behaviour (Granow et al., 2018; Merrill & Rubenking, 2019). Also, when a binge-watching session is interrupted or terminated, that can lead to feelings of stress and anxiety (Panda & Pandey, 2017). Consequently, individuals are motivated to continue watching to avoid those negative sensations and maintain their relaxed feeling. In a study examining factors for television addiction where they monitored physical factors such as the heart rate and brain waves, Kubey and Csikszentmihalyi (2002) found that watching TV alleviated stress and had a relaxing effect on viewers. However, this feeling was cut off when the viewing session ended. Panda and Pandey (2017) argue that those findings may apply to binge-watching as well.

In the field of psychology, stress is defined as the body's response to frustration, demand, or threat (Selye et al.,1936, as cited in Lin et al., 2016). Lin et al. (2016) argue that stress can be a helpful reaction of the body, however, when it lasts over a long period of time, it negatively impacts health, mood, relationships, and quality of life. Furthermore, stress increases the risk of strokes and mental disorders. Therefore, examining sources of stress in individuals' everyday life and measuring related stress levels is important to prevent harm and lower health-related risks.

An individual's perceived stress level may differ both before and after VoD watching and could be affected by factors such as the motivation for that viewing session. For instance, an individual motivated by an unproblematic motivation, such as entertainment, might experience lower stress levels after watching than an individual motivated by a problematic motivation, such as escaping reality. Thereby, it is also of interest to understand if and how motivations change over time on the individual level and how they relate to elevated problematic VoD watching behaviours and outcomes, such as stress. More insight on the temporal relation between VoD watching and stress and the role of motivations for VoD watching could further provide insight on the differences between problematic and unproblematic VoD watching in individuals and contribute to a more differentiated

understanding of binge-watching. Thus, this study aims to examine individual differences in motivation for VoD watching and how they relate to perceived stress levels before and after watching. VoD watching hours are analysed since the phenomenon of binge-watching has no conclusive definition until this point (Flayelle et al., 2020; Starosta & Izydorczyk, 2020). Binge-watching is seen as a fluent concept in which more VoD watching hours indicate more binge-watching. Using an ESM study design, this study examined the following research questions:

RQ1: What is the relationship between motivation for VoD watching and the number of hours spent on VoD watching?
RQ2: How is VoD watching associated with perceived stress over time?

RQ3: Does motivation for watching moderate the relation between VoD watching and perceived stress on the same day and on the next day?

Method

Design

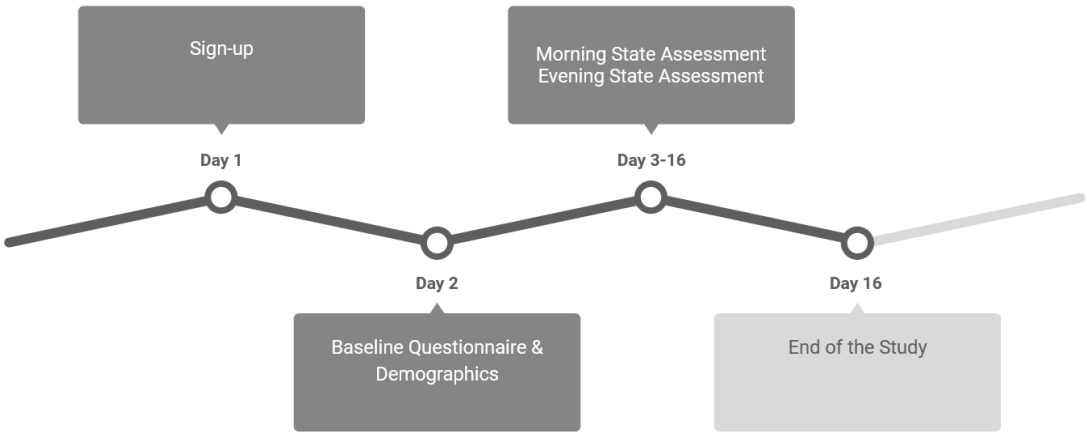
The participant recruitment and data collection of this research project was a joint effort of six Psychology students and resulted in six bachelor theses. The research was approved by the Ethics Committee of the Faculty of Behavioural Sciences (ECBMS) at the University of Twente (210327). All participants gave informed consent and were informed of their right to withdraw from the study without stating a reason.

To measure daily VoD watching behaviour and (mental) health-related concepts an ESM study design was employed. For 15 days (starting on April 7, 2021, ending on April 22, 2021), participants received two daily questionnaires via the mobile application Ethica. Van Berkel et al. (2017) argued that it is currently common practice to employ ESM studies for around two weeks because that ensures an adequate response rate if multiple short questionnaires are administered per day. Using the platform Ethica (https://ethicadata.com/), researchers can set up online studies that participants are able to access via their mobile devices. After recruiting the participants, the researchers sent an invitation email explaining how to download the mobile Ethica application, register and enter the study using a specific code (Appendix A). Participants were also informed about the length and the practicalities of the study. After entering the study code, they received the informed consent form (Appendix B).

On the day after registration, participants received a notification to fill out a baseline- and a demographics questionnaire that remained available until the end of the study. As the data collection was a joint effort for six individual theses, the participants received some questionnaires and items that were not relevant to this study. All created questionnaires can be found in Appendix C. From the second until the last day of the study, participants completed two short self-assessments in predetermined time intervals, namely from 8 am until 12.30 pm and from 6 pm until 12 am. This interval-contingent sampling approach ensured that participants feel less burdened because they easily understand what they have to do and how to integrate this task into their daily routine (Palmier-Claus et al., 2019). Also, setting regular time intervals for the assessment made the results from different days comparable to each other. There were only two questionnaires per day to further decrease the burden for the participants and ensure a more complete data set. To inform them about an available questionnaire, an immediate notification and a reminder after a pre-set amount of time was sent. When the given time interval ended the questionnaire expired and was not available anymore. After the last self-assessment, an email was sent to all participants thanking them for their participation (Appendix D). Figure 1 illustrates the timeline of the study design.

Figure 1

Timeline of the Study Design



Participants

For the recruitment of participants, convenience sampling was used. The researchers searched for volunteers in their social environment. Since van Berkel et al. (2017) argued that the mean sample size of previous ESM studies was 53 with a median number of 19, the researchers aimed for a minimum sample size of 53 participants to ensure reliability and validity of the measurements. In total, 81 participants signed up for the study and 75 completed it with a response rate greater than 69.6% and were considered for further analysis. This cutoff score was based on the average response rate of ESM studies analysed by Berkel et al. (2017). Further inclusion criteria were a minimum age of 18, proficiency in English and completion of the baseline questionnaire. One person did not complete the baseline questionnaire, thus, the total sample size for analysis was 74.

Measurements

For this study, previously established assessment scales could mostly be employed for the constructs of interest since the study was conducted in English.

Demographics

In the demographics questionnaire, participants were asked about their gender, nationality, age, and occupation. Also, they were asked which streaming services they were using ("Which streaming services are you using? (multiple answers possible)"). They could choose within the following answers: "Netflix", "Amazon Prime", "Disney+", "TVNow", "Joyn", "Youtube", "Sky", "Hulu", "Maxdome", "Dazn", "Other" and "I do not use streaming services".

Baseline Questionnaire

To measure baseline trait stress, the Perceived Stress Scale (PSS-10) was used (Cohen et al., 1994). The PSS-10 consists of ten items, such as "In the last month, how often have you found that you could not cope with all the things that you had to do?" and answer options range from 0 ("Never") to 4 ("Very Often") (Cohen et al., 1994). The scale measures the respondent's trait level of stress and their perception of how unpredictable, uncontrollable, and overloaded their life is. Higher scores indicated higher levels of stress and were associated with greater vulnerability to stressful life-event-elicited depressive symptoms and failure to quit smoking

supporting the scale's validity. Additionally, the scale correlates with the original long PSS and Stress Measures, Self Reported Health and Health Services Measures and Health Behaviour Measures as well (Cohen, 1988, as cited in Cohen et al., 1994). Moreover, the PSS-10 demonstrated validity and reliability in various contexts and cultures (Andreou et al., 2011; Leung et al., 2010, Remor et al., 2006) and also among students (Roberti et al., 2006). Andreau et al. (2011) found a Cronbach's alpha value of 0.82 for the PSS-10 and Leung et al. (2010) recommended it after comparing it to the four-item and fourteen-item versions of the PSS. The Cronbach's alpha value of the PSS-10 in this study was comparably high ($\alpha = .861$).

Daily VoD Watching Behavior

In the morning daily questionnaire, the number of hours and episodes the participants engaged in VoD watching and the time of the day they started watching were measured. They were asked how many hours they used VoD services ("How **long** did you watch VoD services **yesterday**?") and had the option to answer "I did not watch", "Less than 1 hour", "1 hour", "2 hours", [...], "More than 5 hours". In case they did not watch a full hour, they were asked to round up or off. To indicate the number of episodes they watched ("How many **episodes** did you watch **yesterday**?") they could type in an integer and they were asked to count movies as episodes. Additionally, they were asked every morning why they used VoD services ("What were your **reasons** for watching?"). Participants could select multiple answers of the following: "Entertainment", "Boredom/nothing else to do", "Stress", "Interest/Curiosity", "Escape from reality/distraction", "Procrastination/Avoidance of other responsibilities", "Information seeking", "Peer activity (watching with friends/family)", "Relaxation/taking a break", "Loneliness", "Other", "I did not watch VOD services".

Daily State Stress

Daily state stress levels were measured with the validated Stress Numerical Rating Scale-11 (SNRS-11; Karvounides et al., 2016). According to Karvounides et al. (2016), this scale shows good reliability and validity. This one-item scale measures an individual's current perceived stress level ("What is your **current stress level**?"). To indicate their stress level, the participants used a slider scale from 0 to 10. The left side of the scale was labelled "not stressed at all", and the right side "extremely stressed". Karvounides et al. (2016) suggested that scores below 3.75 indicate low stress levels. In the current study, scores between 0 and 3 were

considered to indicate low stress levels, scores between 4 and 7 moderate levels and between 8 and 10 the stress levels were deemed to be high.

Procedure

On the first day, the participants had to download the Ethica mobile application, sign up for the study using a provided code, and give informed consent to participate. On the second day, the demographics and baseline questionnaire were made available to participants. On the third day, the first daily questionnaires were made available. They received two notifications in the morning, one immediately after the questionnaire was released and the other 135 minutes after. In the evening, they received one immediate reminder and one after 3 hours. On the last day of the study, the participants received an email thanking them for their participation.

Data Analysis

After downloading the data sets from the Ethica platform, they were edited in Microsoft Office Excel (2016) and analysed using the IBM SPSS Statistics programme. The four datasets were merged together, and participants who completed less than 70% of the assessments were excluded from the final data set.

A new dummy variable was created to indicate present problematic motivations for VoD watching (1 = problematic motivation present). The motivations to watch that were defined as problematic motivations were “Boredom/Nothing else to do”, “Stress”, “Escape from Reality/Distraction”, “Procrastination/Avoidance of Responsibilities”, “Loneliness”. Also, two dummy variables with different indications for binge-watching were created for descriptive purposes (1 = binge-watching). One defines binge-watching as watching more than two episodes and one hour and the other as watching two or more episodes. To obtain the means, standard deviations and percentages of the individuals' demographics and information related to their VoD watching and stress levels, descriptive statistics were used. Additionally, the frequency tables for VoD watching hours, problematic and unproblematic motivations for watching, morning- and evening stress means, and the total stress scores from the 10-item baseline questionnaire were explored.

To test the different research questions, a series of LMMs was used. This model was chosen to take into account the nested structure of the longitudinal data set (Scollon et al., 2009) and to obtain estimated marginal means across participants and time points. To do so, a first-order autoregressive covariance structure (AR1) was used with homogeneous variances for all

LMMs. The AR1 was employed because of the assumption that the dependency among the data points per participant would decrease over time. The point in time was set as the repeated measurement and the participants' IDs as the subjects. Standardised values were indicated by β and unstandardised ones by B. The effects of standardised estimates below .3, from .3 to .5, and larger than .5 were considered weak, moderate and strong, respectively (Cohen, 1988). For the significance level .05 was used.

LMMs were first used for descriptive purposes to obtain estimated marginal means of the variables stress in the morning, stress in the evening, hours and episodes over time. Those variables were set as the dependent variables and time as a fixed effect. Moreover, the association between hours and episodes as indicators for VoD watching amount was examined with an LMM. Therefore, the hours variable was set as the dependent variable and the episodes variable as a fixed covariate. Afterwards, the analysis was repeated with episodes as the dependent variable and hours as a fixed covariate. Furthermore, it was investigated whether the SNRS-11 and the PSS-10 measure a related concept and whether they could substitute for each other. To do so, an LMM with the PSS-10 total score as the dependent variable and stress in the morning as a fixed covariate was utilised. The same analysis was repeated with stress in the evening as a fixed covariate. Then, the participants' individual patterns of VoD watching hours, stress levels and motivations were analysed using LMMs.

To statistically test the first research question, an LMM with hours watched as the dependent variable and the dummy-coded problematic motivation for watching as fixed covariate was employed. This was done with both unstandardised and standardised variables to obtain both standardised and unstandardised estimates from the LMMs. For the second research question, an LMM with the standardised and unstandardised values of stress in the morning/evening as the dependent variable and hours as fixed covariate was used. Additionally, to match the watching hours to the stress levels of the same day, two standardised lag variables were created for the stress measurements using the Lag(1) function. This way, two new variables were set that displayed the stress level of the previous day since the report of the watching hours always concerned the day before. A LMM was adopted with the new lag variables as fixed covariates and hours as the dependent variable.

The third research question was analysed in two steps. Firstly, an LMM was used to test if motivation moderates the relationship between watching hours and stress on the day after watching. Two LMM were run, one with stress in the morning as the dependent variable and one with stress in the evening. Motivation, hours watched and their interaction term were set

as fixed effects. The same analysis was operated again for the standardised variables. Secondly, it was determined if motivation moderates the relationship between stress and hours watched on the same day when stress was the independent variable. The same procedure as before was applied. The lag variables of stress in the morning and in the evening were used as fixed covariates, problematic motivation as a fixed factor and hours as the dependent variable.

Results

Demographics of the Sample Population

In total, 81 individuals participated in this study. For the analysis, seven participants were excluded due to a response rate of less than 69.6% and one because he did not complete the PSS-10 questionnaire. After the exclusion of those participants, the average response rate was 93%. The sample consisted of 82.4% female participants, most of them were young adults (M = 22.96; SD = 5.51). A vast majority were German (94.6%) and currently studying at a university (77%) (Table 1).

Table 1

Demographics of Respondents

Demographics		*n* (%)	*M* (*SD*)
Age in years	19 - 26	72 (97.3)	22.96 (5.51)
	48 - 60	2 (2.7)	
Gender	Male	13 (17.6)	
	Female	61 (82.4)	
Nationality	German	70 (94.6)	
	Dutch	1 (1.4)	
	Other European	3 (4.1)	
Occupation	Student	57 (77)	
	Apprentice	6 (8.1)	
	Part-time employee	3 (4.1)	

	Full-time employee	5 (6.8)
	Unemployed	1 (1.4)
	Other	2 (2.7)

Note: The number of respondents is indicated by *n*, the mean by *M* and the standard deviation by *SD*.

VoD Watching

Within this sample, 70 people indicated to use Netflix (94.6%) and 53 YouTube (71.6%), as illustrated in Figure 2. On average, people watched between one and two hours ($M = 1.68$; $SD = 1.57$) and between two and three episodes per day ($M = 2.5$; $SD = 3.4$). Over the two weeks, the majority of the measurements indicated more than half an hour of VoD watching (74.2%). There was no significant difference of episodes (F (13, 672.85) = 1.03; $p = .419$) or hours (F (13, 572.16) = 1.54; $p = .1$) watched over time, as displayed in Figure 3. The standardised parameter estimate was significant and strongly positive for the correlation between episodes and hours ($\beta = .54$; $SE = .017$; $p < .001$) and the other way around ($\beta = .86$; $SE = .03$; $p < .001$), confirming that higher numbers of episodes were associated with longer watching times.

Netflix (2013) defines binge-watching as consuming more than two episodes in one sitting. If this criterion was applied, 48.4% of the measurement occasions could be described as binge-watching. However, if binge-watching was defined as a combination of watching at least 2 hours and 3 episodes in one sitting, only 33.3% of the measurements indicated binge-watching.

Figure 2

Frequencies of Streaming Services in the Sample

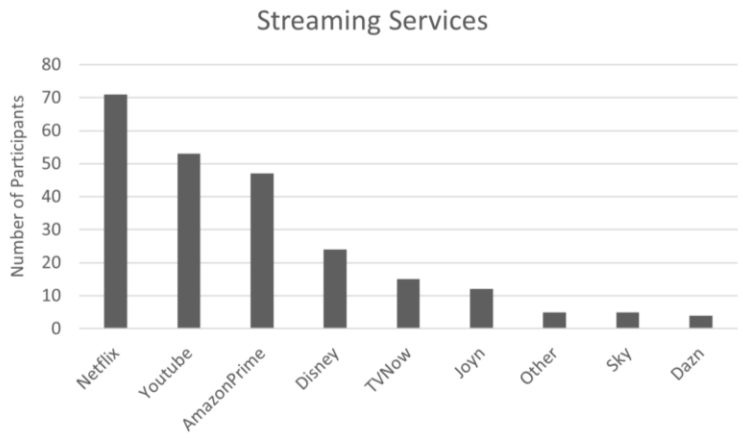
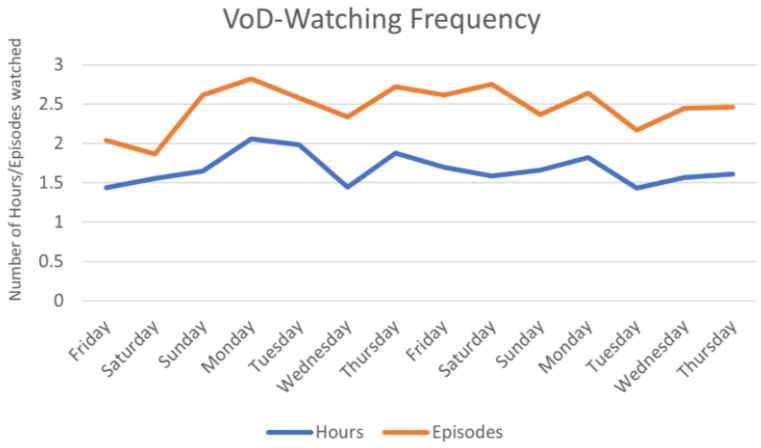


Figure 3

VoD Watching Hours and Episodes

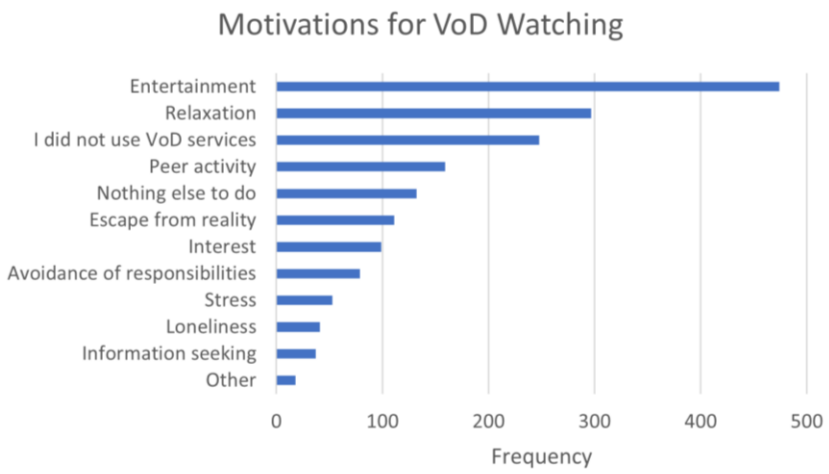


Motivations

The most frequent motivations were “Entertainment” (27%), “Relaxation” (17%) and “Peer activity” (9%). Figure 4 illustrates the frequencies of motivations for VoD watching. In 23.2% of the measurement occasions, there was at least one of those problematic motivations present. For 75.3% of those cases, there was only one problematic motivation, for 18.7%, there were two, for 5.5% three and for .4% five problematic motivations.

Figure 4

Frequency Bar Chart of Motivations



Stress Levels

The baseline scores on the PSS-10 trait measure ranged from a minimum of 5 to a maximum of 32, as indicated in Figure 5 (M = 18.24; SD = 5.78). Stress levels in the daily morning measurements ranged from 0 to 7.92 (M = 3.5; SD = 1.73) and the ones in the evening from 0 to 7.17 (M = 3.02; SD = 1.61). In the morning, 53.6 % of the measurements indicated low stress levels between 0 and 3 and 63.6% in the evening. Moderate stress levels were reported in 42.4% of the morning measurements and 32.2% of the evening measurements. Roughly 4% of both measurements indicated high stress levels between 8 and 10. There were moderate to strong, positive associations between the daily stress measurements and the PSS-10 total score, indicating that they are measuring a related concept (Table 2). However, the correlation was not perfect which shows that the PSS-10 trait measurement cannot substitute daily stress measurements.

The two daily stress measurements are displayed in Figure 6. There was no increase or decrease of stress over time, as the levels did not differ significantly per day except in the morning measurement on the first day (F (13, 633.03) = 4.12; p < .001). The standardised parameter estimate showed a moderate positive effect of time on stress for the first measurement (β = .45; SE = .18).

Figure 5

Frequencies of PSS-10 Scores

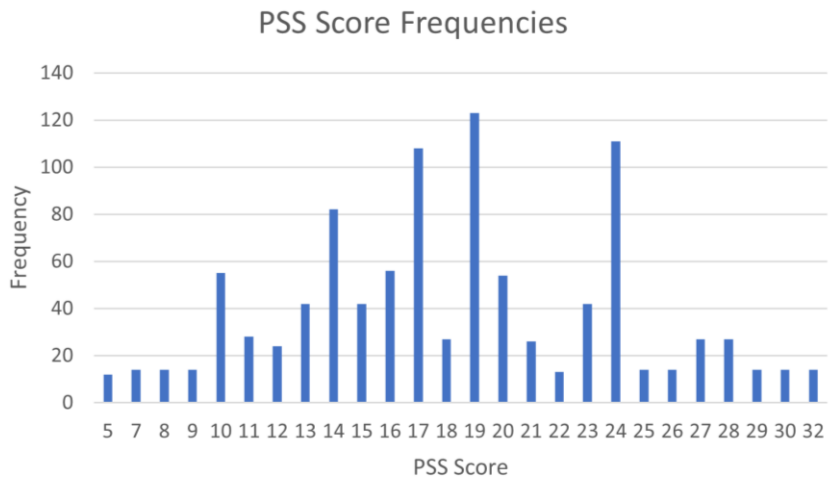


Table 2

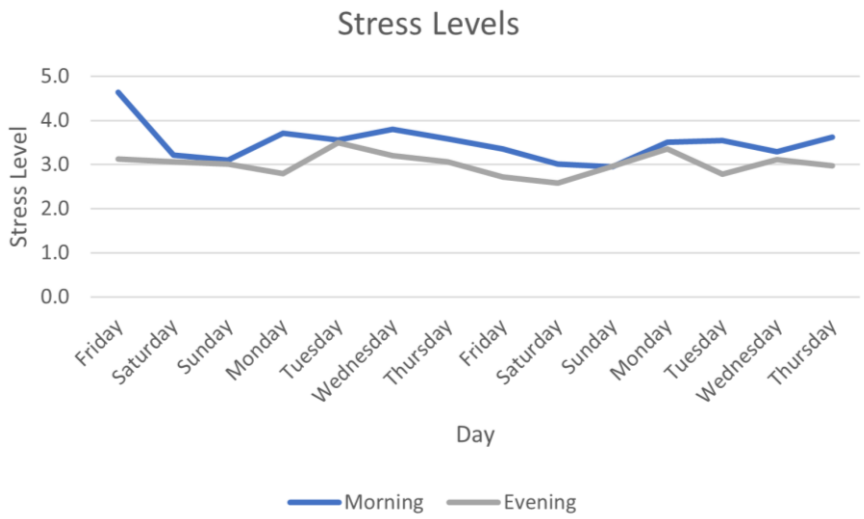
Stress Related Linear Mixed Model Analyses

Dependent variable	Fixed factors	Covariates	β [SE]	95% CI [LB, UB]	F [df1,df2]	p
PSS total	Participant Time point	Stress morning mean	.51 [.02]	[.46, .55]	425.03 [1, 3714.35]	< .001
PSS total	Participant Time point	Stress evening mean	.40 [.03]	[.35, .46]	207.32 [1, 5281.77]	< .001
Stress morning	Participant Time point	Stress evening	.33 [.03]	[.27, .38]	116.59 [1, 824.23]	< .001
Stress evening	Participant Time point	Stress morning	.54 [.03]	[.48, .6]	316.84 [1, 491.61]	< .001

Note. β and SE indicate the standardised B-estimate and the standard error, LB and UB stand for the lower and upper bounds of the 95% confidence intervals.

Figure 6

Morning and Evening Stress Levels over Time



Motivation and VoD Watching Hours

As expected, problematic motivations, such as loneliness or escape from reality, were positively correlated with the hours watched afterwards. The unstandardised parameter estimate showed that participants with problematic motivations watched 1.33 hours longer, which equals to about 80 minutes (B = 1.33; SE = 0.10). This effect was significant (F (1,873.99) = 168.42; $p < .001$). The effect of problematic motivation on watching hours was moderate (β = .37; SE = .03) when looking at the standardised parameter estimate. Participants with problematic motivations had significantly higher VoD watching hours.

Stress Levels and VoD Watching Hours

There was no significant effect of VoD watching hours on the stress level perceived the next day, neither in the morning nor in the evening. However, stress in the morning correlated weakly with less hours watched later that day (β = -.09; SE = .04). This negative effect was weak but significant (F (1, 693.13) = 5.638; p = .018). The unstandardised parameter estimate showed that participants watched about 4 minutes less for every 1-point increase in stress level

reported in the morning (*B* = -0.06; *SE* = 0.03). The more perceived stress in the morning, the fewer watching hours were reported. This correlation was not significant for stress in the evening and watching hours that day.

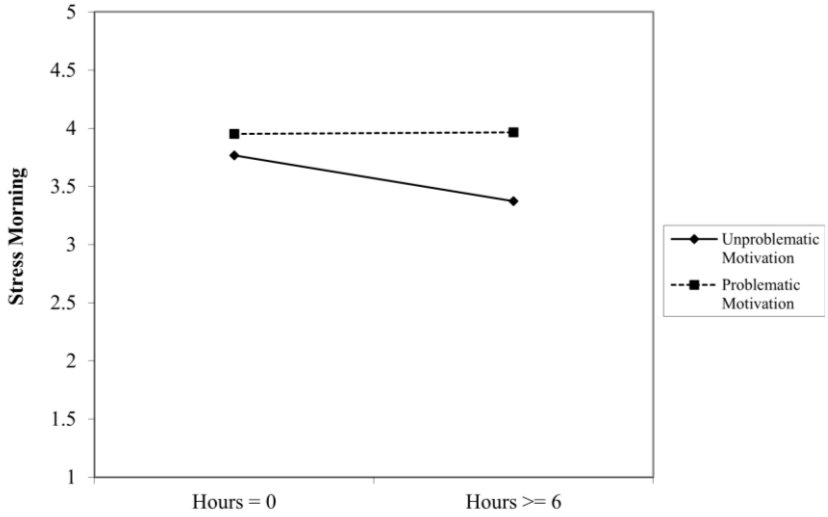
Motivation as a Moderator between Stress Level and VoD Watching Hours

Firstly, it was examined if problematic motivation moderated the relationship between hours watched and the stress levels the next day. For perceived stress in the morning, the interaction effect between motivation, stress and hours watched was significant (*F* (1, 740.71) = 5.1; *p* = .024). The effect was weak and negative (*ß* = -.14; *SE* = .06). If there was no problematic motivation present, the participants felt 0.2 scale points less stressed in the morning after watching (*B* = -0.20; *SE* = 0.09). If participants were motivated by a problematic motivation, the hours watched did not affect the stress experienced the next morning. Figure 7 illustrates this interaction effect. For perceived stress in the evening, there was no significant interaction between problematic motivation, stress and hours watched.

Secondly, it was analysed if problematic motivation moderates the relationship between stress levels in the morning and the evening and the hours watched that day. For the morning stress levels, there was a significant interaction effect (*F* (1, 758.72) = 7.48; *p* = .006). If the relationship between stress in the morning and hours watched that day was moderated by motivation for watching, people watched about 8 minutes less (*B* = -0.13; *SE* = 0.05). This means that participants with a problematic motivation watched 8 minutes less for every stress scale level they indicated in the morning (Figure 8). If there was an unproblematic motivation present, the stress experienced in the morning did not affect the watching hours later that day. The standardised values showed that there was a weak negative effect (*ß* = -.08; *SE* = .03). There was no significant interaction effect found between stress levels in the evening, problematic motivation and hours watched that day.

Figure 7

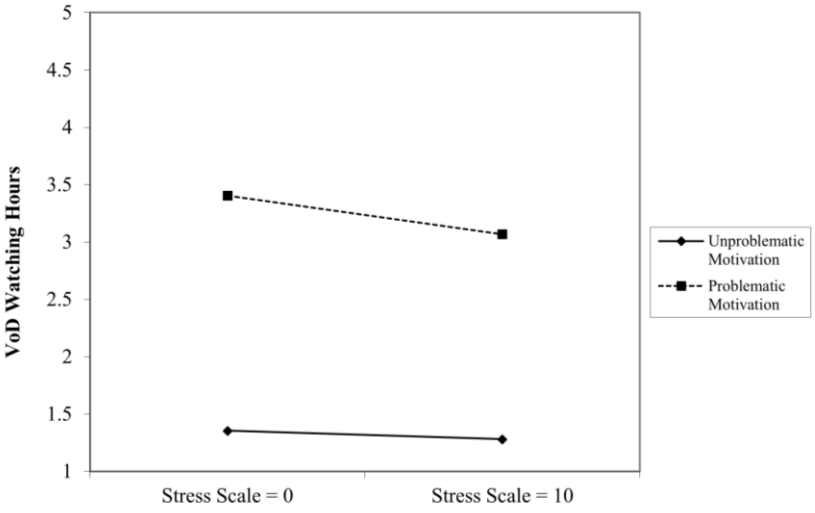
Interaction Effect between Morning Stress, Hours and Motivation



Note. The dependent variable is stress in the morning, the independent is hours and the moderator is type of motivation.

Figure 8

Interaction Effect between Hours, Morning Stress and Motivation



Note. The dependent variable is hours, the independent is stress in the morning and the moderator is the type of motivation.

Discussion

Interpretation of the Main Findings

The purpose of this study was to gain a better understanding of the interplay between VoD watching, motivations for watching and perceived stress over time. There are five important findings of this study. Firstly, it was found that problematic motivations were associated with a higher number of VoD watching hours. Secondly, a negative correlation between stress in the morning and hours watched that day was found, while there was no significant correlation between stress in the evening and watching hours. Thirdly, there was no evidence for the assumption that VoD watching alone influences stress levels the day after VoD watching. Fourthly, if participants watched for unproblematic reasons, more watching hours tended to be associated with lower levels of stress the next morning. Fiftly, higher stress levels in the morning tended to be correlated with fewer watching hours on the same day if there was a problematic motivation present.

Concerning the first research question, the results of this research provide supporting evidence that problematic motivations, such as loneliness or escaping from reality, are indeed associated with more VoD watching. This is consistent with Sung et al.'s (2018) work that showed a correlation between the motivation to pass time and high binge-watching frequency since one of the problematic motivations, namely "Boredom/Nothing else to do" corresponds to passing time. Also, Starosta et al. (2019) suggest that escape from reality and coping with loneliness are related to more binge-watching, which is consistent with the findings of this study. It can be concluded that problematic motivations for VoD watching are associated with more watching hours on the same day. This finding may be explained by the idea that individuals with problematic motivations for VoD watching might believe that VoD services help them to better cope with everyday problems, loneliness and boredom. They might feel overwhelmed or unable to deal with their problems and use VoD services as a break from real life. Using VoD services as a coping mechanism could contribute to more excessive consumption.

The second research question was about the relationship between stress and VoD watching hours. The results of the present study show that the more stress individuals experience in the morning, the less they watch during that day. Although significant, this effect was weak as participants watched about 4 minutes less for every stress scale point they reported in the morning. There was no significant correlation found between stress levels in the evening

and watching hours. Existing literature points in the direction that stress could lead to more binge-watching as students reported that they had a tendency for watching excessively to reduce stress (Matrix, 2014; Susanno et al., 2019). Thus, the findings contradict previous research. However, there is no extensive literature about the relationship between stress and binge-watching. As Ahmed (2017) presumes that people with more free time and less responsibilities are more prone to binge-watch, more responsibilities might restrain this behavior. It might be possible that responsibilities or problems that elicited elevated stress levels, did not allow the participant to engage in excessive VoD watching because of time constraints.

The present study did not provide evidence for any change in stress levels the day after VoD watching. This contradicts existing literature as Panda and Pandey (2017) argue that stress and feelings of guilt are induced by excessive VoD watching. Also, Vaterlaus et al. (2018) noted that stressful feelings might arise after binge-watching. In contrast, if stress relief motivates individuals to watch it could be also hypothesised that they might actually experience less stress after watching. None of those associations could be confirmed by this study. One possible explanation could be that, usually, some hours passed between the VoD watching session and the stress level assessment the next day. Participants had time to answer the daily questionnaire until 12.30 and the possible effects of binge-watching the day before on stress levels afterwards might have already weakened by then. Similarly, there was no effect found on the stress levels in the evening of the next day. If the stress levels of the participants would have been assessed immediately after a VoD watching session, the results might have revealed a different relationship. Future ESM studies could employ an event-contingent protocol and ask participants to fill out the questionnaire after they finished a VoD watching session (Christensen et al., 2003).

Concerning the third research question, this study supports that motivation to watch was a moderator of the relationship between stress in the morning and VoD watching hours. If there was no problematic motivation present, they tended to feel less stressed in the morning after VoD watching. So, watching for entertainment or as a peer activity may actually relieve stress compared to watching to procrastinate or cope with loneliness. Thus, negative mental health outcomes such as stress might not only depend on the number of hours watched but also on the intention and motivation for watching. Previous research suggested that watching was used as a coping mechanism to deal with stress (Matrix, 2014; Susanno et al., 2019). The present finding proposes that this strategy might be successful if it is used as a conscious

decision to entertain oneself or relax instead of suppressing stress or thoughts of unfinished tasks. Additionally, Starosta et al. (2020) found that the motivation to deal with loneliness and to escape reality induced negative health consequences. Since the absence of those motivations was associated with less stress, this is in line with the present article. Nonetheless, Starosta et al. (2020) also reported that informative motivation was correlated with induced negative health consequences. Information motivation was considered an unproblematic motivation in this study, therefore, this finding contradicts the notion that unproblematic motivations lead to less stress. Thus, this study partly contradicts previous research. Finally, there was no effect for stress in the evening. This can be explained by the time passed after the VoD watching session. In the evening, people's stress levels may not be influenced anymore by the VoD watching and its motivation the day before.

Reversely, stress in the morning and VoD watching hours the same day was moderated by motivation to watch as well. People with problematic motivations tended to watch less the more stressed they felt. Individuals might experience stress because of the tasks they have to complete that day and might be motivated to use VoD services to procrastinate or escape from those real-life responsibilities. If that is the case, they engage less heavily in VoD watching on that day. This might be explained by the external pressure to finish their tasks and restricted time periods to watch something. Feeling responsible and guilty might also shorten their VoD watching sessions. There was no effect found for stress in the evening and VoD watching behaviour. Since most people watched in the evening, this stress measurement was probably closer to the watching behaviour for most participants than the measurement in the morning. Thus, it is surprising that there was an effect found for the morning but not for the evening measurement. A possible reason is that the evening measurement could have been confounded since it was not always taken after watching but possibly also during, in-between or after a VoD watching session. In contrast, the morning measurement was most probably completed before participants engaged in VoD watching that day.

Strengths

The present study can record some specific strengths such as the relatively large sample size and high response rate. The study's sample size is larger than the mean sample size of 53 of previous ESM studies (van Berkel et al., 2017) and after the exclusion of participants the average response rate was 93%. In fact, only six participants completed less than 69.6% of the measurements. Besides that, there are some strengths of the ESM design applied in this study

that are worth mentioning. Frequently used methods to investigate binge-watching, such as cross-sectional retrospective (correlational) surveys, rely on retrospective memories of the participants. In contrast, the ESM takes into account participants' current emotional states and feelings as well. Collecting this real-time data helps to reduce recall biases since individuals more readily recall events that happened recently (Trull & Ebner-Priemer, 2009). Also, simpler cognitive operations are required for ESM assessments as questions are usually more straightforward, for instance the question "What is your current stress level?" in the present study (Trull & Ebner-Priemer, 2009). As a result, ESM data is assumed to be more accurate and less prone to errors than data of traditional methods.

Trull and Ebner-Priemer (2009) also argue that self-report measures conducted in participants' natural environments are less obtrusive and easy to execute. In the present study, participants could integrate filling out the questionnaires in their everyday lives because of the large time windows and reminders sent by the application. Furthermore, the ESM allows us to assess data about the context of measurements. This is critical, especially when measuring problematic emotions or behaviours, since there might be some conditions and settings in which they occur more frequently. To name an example, individuals might be more likely to engage in excessive VoD watching behaviour in the evening after work. The ESM can account for this and collect data about the time of the day or the place. Another strength of the ESM is that the multiple and longitudinal measurements result in a large and detailed body of data and patterns of stress and VoD watching behaviours can be mapped out. Altogether, the ESM appears as an accurate and effective method of measuring the present constructs in this study.

Limitations

Despite the strengths of the ESM design, there are also some specific limitations to this study. Self-reports can be distorted when individuals have limited introspective abilities and problems reflecting on their behaviours, moods or stress levels. Moreover, their answers could have been influenced by what is considered socially desirable, thus conforming to social norms (Scollon et al., 2009). Another way the data could have been distorted is by expectancy effects, as the participants received the same questionnaires at the same time every day (Palmier-Claus et al., 2019). Knowing the questions and remembering their previous answers might have led to results diverging from their actual experience. Also, they could have been tempted to not reflect their feelings critically anymore but give the same response every day. For instance, they might have thought that they are usually laid back and therefore always chose a low stress

level without pondering their momentary feelings. However, if they reflected those questions critically every day, they could have become more aware of their watching behaviour and daily stress levels (Scollon et al., 2009). This in turn could have altered their behavior or feelings and distorted the studies results. Though, no change in watching hours or stress levels over time was observed on the group level in the current study.

Another potential limitation is that there were only two daily measurements of stress, while most ESM studies conducted in one or two weeks employed between eight and twelve assessments per day (Christensen et al., 2003). With more observations per day, fluctuations of stress levels could have been assessed with higher accuracy. However, it would have also posed a greater burden for the participants to answer eight questionnaires per day. Finally, a potential limitation concerns the homogeneity of the sample. As a consequence of the applied convenience sampling strategy, the sample population mostly consists of young, female German students. This specific demographic group is overrepresented in the current study. However, since this study did not aim at observing absolute strength of effects but focused on associations only, it still contributes to the present literature as it examines VoD watching specifically of German students.

Implications for Future Research

In this study, VoD watching hours were analysed instead of setting a rule for what is considered binge-watching. Still, the findings are comparable to previous studies since it is suggested that more VoD watching hours indicate more binge-watching. Binge-watching does not have a conclusive definition and is better seen as a fluid concept that is indicated by VoD watching hours. In this paper, it is assumed that binge-watching is better described on a continuous scale than by defining a precise cut-off point. Future research could define levels of weak, moderate and high binge-watching behaviour calculated by the hours and episodes people consumed. Analysing the relationship between levels of binge-watching and stress could yield more nuanced results.

This study contributes to existing research of binge-watching in relation to stress by introducing motivation for watching as a moderator. Stress in the morning was associated with fewer watching hours that day. Whereas stress is associated with more watching hours at the group level, this relationship was moderated by the presence of a problematic motivation. Although the effect sizes were weak, it remains worth exploring further to what extent motivation moderates the link between health indicators and watching behaviour. Another

point of interest is that VoD watching elicited lower stress levels on the day after if individuals were motivated by an unproblematic motivation. Findings such as this one underline the importance of not over-pathologising this highly common activity. In line with Flayelle et al. (2020), this study suggests that high but healthy modes of VoD watching should be differentiated from problematic watching behaviours. Much work remains to be done to understand the conditions under which VoD watching could have a relaxing effect and how long it lasts. Altogether, it would be helpful to extend the current findings by examining if VoD watching causes or prevents negative health implications and if the reflection of people's motivations can refine this understanding. Future research should focus on this distinction between unproblematic and problematic VoD watching and further explore what characterises them.

Conclusion

The aim of this research was to investigate the interplay between VoD watching, its motivations and stress. Meaningful data was collected showing that motivations moderate the relationship between stress and watching hours. More VoD watching hours correlated with lower stress levels the day after if individuals were motivated by an unproblematic motivation, such as entertainment or interest. Moreover, stress tended to be associated with more watching hours that day if there was a problematic motivation present, such as escaping reality or loneliness. In contrast, the overall correlation between stress and watching was negative, meaning that higher stress was correlated with fewer watching hours. The introduction of motivation as a moderator reversed this relationship. However, all these effects were weak and further research among a more heterogeneous sample is needed to establish motivation as a moderating variable between VoD watching and health-related concepts, such as stress. This ESM study collected meaningful results about momentary feelings and daily behaviours and contributed to a more differentiated understanding of the concept of binge-watching.

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Appendix A

Invitation emails

Dear Participant,

Thank you very much for taking your time and supporting us with our bachelor thesis study! We will tell you everything you need to know before you can get started.

Overall, the aim of the study is to have a look at video on demand (VOD) watching behaviour and health related concepts. With the help of our questionnaires, we would like to gain more insights into your viewing behaviour over the next 14 days.

As of today, we would kindly like to ask you to download the **Ethica Data** app for either your Android or IOS smartphone. You will use this app on a daily basis to answer our little questionnaires and help us gather data.

Once you downloaded the app and created an account with your mail address, you can click on **Join Study** and enter the following code:

1712

And just like that you are part of our research!

To get started we would like to ask you to read our consent form and indicate whether you like to participate or not. After that you are done for today! **Tomorrow** you will receive your **first two questionnaires**, remember that these might take a little bit longer as these are baseline questionnaires. You probably will need 10 – 15mins to answer them. **After that**, you will receive a morning and an evening questionnaire for the next 14 days. These questionnaires are really short and will take you approximately 3mins in total to complete.

That is all you need to know! We would like to thank you again and wish you a lot of fun answering the questions.

Maybe you can even find out more about yourself!

Your dedicated psychology researchers,

Christine, Naomi, Lara, Annika, Celine and Jeremy

Appendix B

Informed Consent Form

Informed consent

Welcome to our study about video-on-demand (VOD) watching behaviour!

Thank you for your time and support! Please read the following information carefully.

The aim of this research is to explore the relation between VOD watching and (mental) health-related variables. With your participation in this research you will help to make a contribution to the scientific knowledge of VOD watching behaviour.

You can participate in this study if you are at least 16 years old and proficient in English. Ethica is used over a 14-day period to respond to short questionnaires on a daily basis. Please make sure that the notifications on your device for the application (Ethica) are turned on. This facilitates you to answer the questions in the predetermined time frame.

At the start of the study, you will be asked to fill out a baseline questionnaire with questions about demographics, and personality traits. This questionnaire will take around 10 minutes to fill out. From the 8th of April, you will be asked to fill out a short questionnaire twice a day.

The questionnaire will be around 5 minutes and the questions asked are about your mood, behaviour and feelings.

This research is not expected to pose any risks. One side effect that can occur is that you might be more aware of your daily mood, behaviour, and feelings. The participation in this study is voluntary. If you wish to withdraw from this research, you can do so at any time without giving a reason.

All your answers will be treated confidentially. Therefore, all personal data (e.g., e-mail, age, gender, etcetera) will be anonymized and will not be published and/or given to a third party.

The study has been approved by the Ethics Committee of the University of Twente, and is thus compliant with internationally recognised guidelines on ethical research.

If any questions or concerns arise before, during or after your participation, do not hesitate to contact the researchers:

Christina Ernsting (c.ernsting@student.utwente.nl), Jeremy Hanhoff, Celine Mezielis, Naomi Nitsche, Lara Schwerdtner

I have fully read and understand the text above and I am willing to participate in this study.

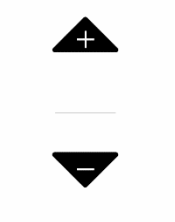
Appendix C

Demographics and General Information

Thank you for participating in our study and welcome to your first questionnaire 😊 With this questionnaire we want to gain some information about you and your background - no worries, just some casual facts. Have fun filling it out!

PS: concerning the whole study coming up: please try to fill out the questionnaires on time! You will receive reminders so you won't forget it since we know how easily that can happen. Still, *if* it happens that you forget to fill out one questionnaire that is okay, please just continue with the next ones, so we can still use the data! Thank you 💟

1. What is your age?



2. What is your gender?
    - Female
    - Male
    - Diverse
    - Wish not to disclose
3. What is your nationality
    - German
    - Dutch
    - Other European
    - Non-European
4. What is your occupation
    - Pupil
    - Student
    - Apprentice
    - Part-time employee

- Full-time employee
- Unemployed
- Self-employed
- Other

5. Which streaming services are you using?
    - Netflix
    - Amazon Prime
    - Disney+
    - TVNow
    - Joyn
    - Youtube
    - Sky
    - Hulu
    - Maxdome
    - Dazn
    - Other
    - I do not use streaming services

Great work! Thank you for your information, if you have a couple more minutes, please take a look at the baseline measurement. Thank you!

Baseline measurement

Please fill out this questionnaire! Thank you!

This questionnaire only needs to be filled out **once**. We know this one is a bit longer than the others (it will take you around 10 minutes to fill it out) but please take your time and answer

as honestly as possible. The daily questionnaires will take you **way less** time to fill out, we promise! 😊

1. In the last month, how often have you been upset because of something that happened unexpectedly?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
2. In the last month, how often have you felt that you were unable to control the important things in your life?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
3. In the last month, how often have you felt nervous and “stressed”?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
5. In the last month, how often have you felt that things were going your way?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
7. In the last month, how often have you been able to control irritations in your life?
    - Never
    - Almost Never

- Sometimes
- Fairly Often
- Very Often

8. In the last month, how often have you felt that you were on top of things?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
9. In the last month, how often have you been angered because of things that were outside of your control?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
    - Never
    - Almost Never
    - Sometimes
    - Fairly Often
    - Very Often
11. I am relaxed most of the time
    - Very accurate

- Moderately accurate
- Neither inaccurate nor accurate
- Moderately inaccurate
- Very inaccurate

12. I seldom feel blue
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate
    - Moderately inaccurate
    - Very inaccurate
13. I get stressed out easily
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate
    - Moderately inaccurate
    - Very inaccurate
14. I worry about things
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate
    - Moderately inaccurate
    - Very inaccurate
15. I am easily disturbed
    - Very accurate
    - Moderately accurate

- Neither inaccurate nor accurate
- Moderately inaccurate
- Very inaccurate

16. I get upset easily
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate
    - Moderately inaccurate
    - Very inaccurate
17. I change my mood a lot
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate
    - Moderately inaccurate
    - Very inaccurate
18. I have frequent mood swings
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate
    - Moderately inaccurate
    - Very inaccurate
19. I get irritated easily
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate

- Moderately inaccurate
- Very inaccurate

20. I often feel blue
    - Very accurate
    - Moderately accurate
    - Neither inaccurate nor accurate
    - Moderately inaccurate
    - Very inaccurate
21. Please indicate now, how often do you experience the following feelings:

    I experience a general sense of emptiness.
    - None of the time
    - Rarely
    - Some of the time
    - Often
    - All of the time
22. There are plenty of people I can rely on when I have problems.
    - None of the time
    - Rarely
    - Some of the time
    - Often
    - All of the time
23. There are many people I can trust completely.
    - None of the time
    - Rarely
    - Some of the time

- Often
- All of the time

24. I miss having people around.
    - None of the time
    - Rarely
    - Some of the time
    - Often
    - All of the time
25. There are enough people I feel close to.
    - None of the time
    - Rarely
    - Some of the time
    - Often
    - All of the time
26. I often feel rejected.
    - None of the time
    - Rarely
    - Some of the time
    - Often
    - All of the time
27. I fear others have more rewarding experiences than me
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me

- Extremely true of me

28. I get worried when I find out my friends are having fun without me.
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me
    - Extremely true of me
29. I get anxious when I don't know what my friends are up to.
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me
    - Extremely true of me
30. It is important that I understand my friends "in jokes".
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me
    - Extremely true of me
31. Sometimes, I wonder if I spend too much time keeping up with what is going on
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me

- Extremely true of me

32. It bothers me when I miss an opportunity to meet up with friends.
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me
    - Extremely true of me
33. When I have a good time it is important for me to share the details online.
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me
    - Extremely true of me
34. When I miss out on a planned get-together it bothers me.
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me
    - Extremely true of me
35. When I go on vacation, I continue to keep tabs on what my friends are doing.
    - Not all true of me
    - Slightly true of me
    - Moderately true of me
    - Very true of me

- Extremely true of me

36. You are almost done! Just a few questions more 🏁

37. I am good at resisting temptations

- Not at all like me
- Not like me
- Neutral
- Like me
- Very much like me

38. I have a hard time breaking bad habits

- Not at all like me
- Not like me
- Neutral
- Like me
- Very much like me

39. I am lazy

- Not at all like me
- Not like me
- Neutral
- Like me
- Very much like me

40. I say inappropriate things

- Not at all like me
- Not like me
- Neutral
- Like me

- Very much like me

41. I do certain things that are bad for me if they are fun
    - Not at all like me
    - Not like me
    - Neutral
    - Like me
    - Very much like me
42. I refuse things that are bad for me.
    - Not at all like me
    - Not like me
    - Neutral
    - Like me
    - Very much like me
43. I wish I had more self discipline
    - Not at all like me
    - Not like me
    - Neutral
    - Like me
    - Very much like me
44. People would say that I have iron self-discipline
    - Not at all like me
    - Not like me
    - Neutral
    - Like me
    - Very much like me

45. Pleasure and fun sometimes keep me from getting work done
    - Not at all like me
    - Not like me
    - Neutral
    - Like me
    - Very much like me
46. I needlessly delay finishing jobs, even when they're important.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
47. I postpone starting on things I don't like to do.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
48. When I have a deadline, I wait until the last minute.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
49. I delay making tough decisions.

- Disagree
- Slightly disagree
- Neither disagree nor agree
- Slightly agree
- Agree

50. I keep putting off improving my work habits.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
51. I manage to find an excuse for not doing something.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
52. I put the necessary time into even boring tasks, like studying.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
53. I am an incurable time waster.
    - Disagree

- Slightly disagree
- Neither disagree nor agree
- Slightly agree
- Agree

54. I'm a time waster now but I can't seem to do anything about it.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
55. When something's too tough to tackle, I believe in postponing it.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
56. I promise myself I'll do something and then drag my feet.
    - Disagree
    - Slightly disagree
    - Neither disagree nor agree
    - Slightly agree
    - Agree
57. Whenever I make a plan of action, I follow it.
    - Disagree
    - Slightly disagree

- Neither disagree nor agree
- Slightly agree
- Agree

58. Even though I hate myself if I don't get started, it doesn't get me going.

- Disagree
- Slightly disagree
- Neither disagree nor agree
- Slightly agree
- Agree

59. I always finish important jobs with time to spare.

- Disagree
- Slightly disagree
- Neither disagree nor agree
- Slightly agree
- Agree

60. I get stuck in neutral even though I know how important it is to get started.

- Disagree
- Slightly disagree
- Neither disagree nor agree
- Slightly agree
- Agree

61. Putting something off until tomorrow is not the way I do it.

- Disagree
- Slightly disagree
- Neither disagree nor agree

- Slightly agree
- Agree

62. YOU DID IT! We are proud of you, thank you so much for giving us your time 💓 See you again for the daily measurements and like we said, those are not as long as this questionnaire so please keep filling them out 😊

Morning questionnaire

We wish you a wonderful morning 🌞

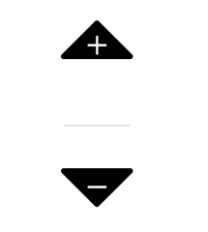
Please take a moment to reflect and fill out this short questionnaire!

1. How **long** did you watch VOD services **yesterday**?

   (If you did not watch a full hour, please just round up/off - e.g., if you watched more than 1 hour and 30 minutes please indicate 2 hours)

   - I did not watch
   - Less than 1 hour
   - 1 hour
   - 2 hours
   - 3 hours
   - 4 hours
   - 5 hours
   - More than 5 hours

2. How many **episodes** did you watch **yesterday**? (please set the number to 0 if you did not watch any episodes and please count all movies/documentaries you watched also as episodes)



3. At what **time** did you start watching video-on-demand content **yesterday**?

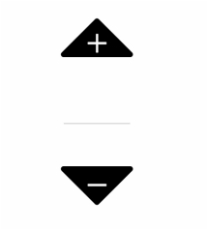
   (Multiple answers possible)

   - Morning (6 a.m. – 12 p.m.)
   - Afternoon (12 p.m. – 6 p.m.
   - Evening (6 p.m. – 11 p.m.)
   - Night (11 p.m. – 6 a.m.)
   - I did not watch VOD services

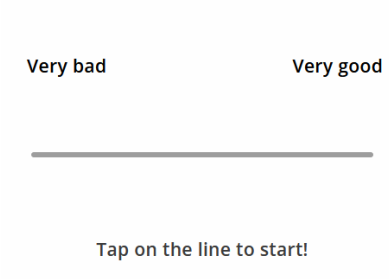
4. What were your **reasons** for watching? (multiple answers are also possible)
   - Entertainment
   - Boredom/Nothing else to do
   - Stress
   - Interest/Curiosity
   - Escape from reality/ Distraction
   - Peer activity (watching with friends/family)

- Procrastination/Avoidance of responsibilities
- Information seeking
- Relaxation/Taking a break
- Loneliness
- Other
- I did not watch VOD services

5. How many **hours** did you **sleep approximately**?

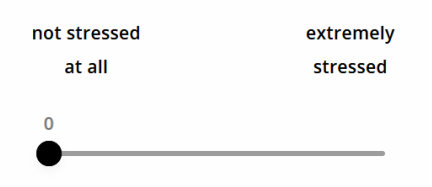


6. Last night, how would you rate your **quality of sleep**?



7. Did you eat a snack yesterday **after dinnertime**?
   - Yes
   - No
   - I cannot remember

8. If you ate a snack yesterday during the evening, which **type(s) of snack(s)** did you eat? (Multiple answers possible)
    - o Chocolate, candy, cake, ice cream or something similar
    - o Chips, flips or something similar
    - o Fruit or vegetables or something similar
    - o Crackers, nuts, yoghurt or something similar
    - o Other
    - o I cannot remember
    - o I did not eat a snack
9. What is your **current stress level**?



10. How **lonely** do you feel at the moment?
    - o Not at all
    - o Only a little
    - o To some extent
    - o Rather much
    - o Very much

That's already all we needed from you for now, see you in the evening.

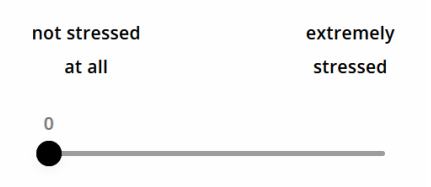
Have a nice day! 💟

Evening Questionnaire

Hello there again,

We hope you had a great day. Now it is time for your evening questionnaire! Please take a short moment and fill it out ✨

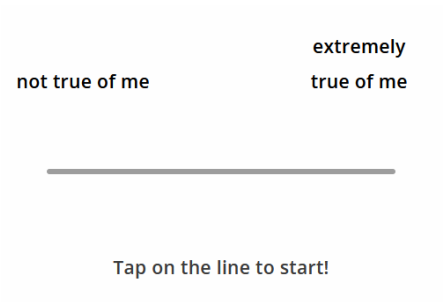
1. What is your current stress level?



2. I intentionally delayed a task today that is personally important to me, although it was unreasonable to put this task off.
   - Disagree
   - Slightly disagree
   - Neither disagree nor agree
   - Slightly agree
   - Agree
3. What kind of planned task did you delay?
   - Household (doing the dishes, cleaning the bathroom etc.)
   - Work (projects, phone calls, protocols etc.)
   - Education (learning for exam, preparation for lesson etc.)

- Leisure activity (exercise, socializing, hobbies etc.)
- Other
- I did not delay any tasks

4. How **lonely** do you feel at the moment?
   - Not at all
   - Only a little
   - To some extent
   - Rather much
   - Very much
5. Do you experience the fear of missing out?



That's already everything we need from you right now 🌙 Have a good night, we will see you tomorrow in the morning xx

Appendix D

Debriefing Mail

Dear Participants,

that's it you are done! Thank you so much for your valuable time spent on this study!

As of Thursday evening the first of you were officially done with the study and even those who started later have now the latest completed the study.

We are so excited to see what the results are revealing about the health related concepts we are investigating. Furthermore we are very thankful for your support with our bachelor theses. If you have any questions left, do not hesitate to contact us!

We wish you a great weekend and hope you could learn something about yourself as well!

Your fellow researchers,

Lara, Celine, Annika, Naomi, Christina and Jeremy