

# Assessing Predictors and Consequences of Video-on- Demand Streaming Behaviour.

An Experience Sampling Study

**Bachelor Thesis**

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## Abstract

**Background.** Spending time watching video content online with various Video-on-demand (VOD) services is becoming more and more common. This study examines the different predictors of watching behaviour and its impact on happiness by using an experience sampling method (ESM). It was expected that exhaustion increases streaming VOD content if the individuals expect to feel better afterwards. Moreover, literature suggested that increased watching of VOD content has a negative impact on happiness but only if individuals feel they are neglecting daily obligations.

**Method.** The study involved 45 participants, who answered questionnaires targeting their mood and watching behaviour over the course of 15 days using ESM. Individuals were asked to answer questions about watching behaviour as well as perceived neglect of daily tasks retrospectively. Mood, level of exhaustion and happiness were assessed three times a day, while watching behaviour was assessed once a day. The longitudinal data were analysed using linear mixed models, simple correlation analyses and multivariate regression.

**Results.** Exhaustion was not a significant predictor of watching time. The expectancy of feeling better after watching was significantly linked to watching time, indicating that individuals watch more VOD-streaming content when expecting a positive outcome. Moreover, the perceived neglect of daily tasks was identified as a significant covariate of happiness. There was a negative, but non-significant correlation between obligation neglect and happiness, indicating that individuals who are happy, tend to perceive less neglect of daily obligations and vice versa. Watching time was a significant covariate of the level of happiness in longitudinal mixed model analysis but this could not be confirmed using simple correlation analysis of averaged values.

**Conclusion.** This study identified individuals with a positive outcome expectancy as a predictor for an increased time of streaming VOD-content. Moreover, individuals who perceive to neglect daily obligations, experience a lowered level of happiness. If watching time increases the feeling of neglecting tasks, it is likely that consequences for happiness follow. Future research should focus on individuals with a positive outcome expectancy towards VOD-streaming, as these tend to display greater amounts of watching time.

Keywords: VOD streaming, exhaustion, happiness, outcome expectancy, experience sampling method

## Introduction

“In a few decades, linear TV will be the fixed-line telephone: no longer mainstream.”  
(Netflix, 2018).

On the plane, the train, at home or the library. Video-on-demand (VOD) services make it possible to watch series, movies or documentaries at any time and anywhere. Streaming services, such as Netflix and Amazon Prime Video, offer the opportunity to watch an unlimited number of episodes or whole series without advertisements in-between (Netflix, 2018). According to Netflix (2018), the internet entertainment branch is expanding quickly due to fast and reliable internet connections, user flexibility as well as the freedom to decide to watch personalised content on any device. Furthermore, the possibility of rapid innovations and improvements through updates is emphasized. All these factors seem to distinguish internet entertainment services from linear TV watching. The availability as well as the scope of services such as Netflix or Amazon Prime Video, steadily rises. The on-demand streaming service Netflix, for instance, increased its operating status from 50 countries in 2010 to 190 countries in 2017 (Brennan, 2018), now covering nearly the whole world. Besides the growing reach of Netflix, the number of subscribers of the VOD service is likely to follow a similar trend. Netflix’s ambitions to grow even further remain high (Netflix, 2018).

The massive availability and popularity of such VOD services give rise to a new phenomenon called “binge-watching”. Binge-watching has been defined as watching two or more episodes of a series in one sitting or in a short amount of time (Davis, 2016; Flayelle et al., 2019; Walton-Pattison, Dombrowski, & Pesseau, 2018). However, various definitions of binge-watching exist. The binge-watching-phenomenon seems to be more prominent than many might expect. Young adults are especially likely to engage in binge-watching behaviour. A report by Shannon-Missal (2013) suggests that individuals aged under 40 are more prone to use streaming services compared to older individuals. Moreover, the article states that 62% of individuals in the US who make use of VOD services frequently view multiple episodes of a TV show in a row (Shannon-Missal, 2013). Trouleau, Ashkan, Ding, & Eriksson (2016) similarly demonstrated that 64% of their participants engaged in binge-watching at least once, while 7.6% of the participants engage exclusively in binge-watching sessions. Walton-Pattison, Dombrowski and Pesseau (2018) reported that their participants binge-watched a mean of 1.42 days per week ( $SD=1.42$ ).

Binge-watching behaviour is desired and therefore intentionally facilitated by on-demand streaming services. Whole seasons of a series are made available at once by VOD services rather than one episode weekly, as in traditional TV (Netflix, 2018). Consequently,

the user does not have to wait for the upload of the next episode but is able to choose freely when to continue watching, which facilitates binge-viewing even more (Trouleau et al., 2016; Shim, Lim, Jung, & Shin, 2018).

However, despite its popularity in society nowadays, research examining the antecedents and consequences of binge-watching seems to be rather limited until now. As indicated by the term “binge”, which carries a substantially negative connotation, consequences associated with binge-watching are not to be underestimated. Poor sleep quality (Exelmans & van den Bulck, 2017) and reduced physical activity (Flayelle et al., 2019; Walton-Pattison, Dombrowski, & Pesseau, 2018) are only a few of many potential consequences research has linked to binge-watching behaviour. Nevertheless, only a few studies were able to identify predictors or motives, which could help to get a clearer picture of the phenomenon “binge-watching”. Thus, it is difficult to analyse patterns or possible risk groups/factors of binge-watching. The identification of such risk factors allows targeting special groups who are at risk and help adjust behaviour before severe consequences in terms of psychological or physical health issues develop. Therefore, this study will investigate predictors of binge-watching as well as their consequences.

### **Theoretical framework**

The definition most commonly used for the term “binge-watching” is oftentimes criticized for being imprecise or not capturing the phenomenon appropriately (Davis, 2016; Shim et al., 2018; Walton-Pattison, Dombrowski, & Pesseau, 2018). Often, binge-watching is simply defined as “two to six episodes of the same show in one sitting” (Davis, 2016). However, this definition disregards the duration of episodes as well as the types of programmes (Davis, 2016). According to this definition, watching two shows lasting for 20 minutes will be equally classified as a binge-watching session as watching two shows lasting for 1-hour. Similarly, Shim et al. (2018) criticised that a definition of the number of episodes as a threshold for binge-watching is a questionable practice with no clear conclusion.

Moreover, the term of binge-watching is criticised in itself. “Binge” implies a negative or pathological behaviour, such as binge-drinking or binge-eating (Pittman & Sheehan, 2015). In general, “bingeing” refers to the excessive consumption of something in a short amount of time. A study by Flayelle, Maurage, and Billieux (2017) suggests that binge-watching itself can be linked to addiction criteria. However, the authors subsequently suggest that such a definition might be misinformed, as the majority of the participants had the feeling of being in control of their behaviours. Therefore, some researchers suggest more positive terms like

“marathon-viewing”, since current research is still ambiguous about the consequences of binge-watching (Perks, 2014). However, according to Pittman and Sheehan (2015), this new term is likely to be associated with television marathons which also had a negative connotation in research. Nevertheless, the scientific literature so far could not confirm that the consequences of this phenomenon are completely negative.

In line with these points, Walton-Pattison, Dombrowski and Presseau (2018) suggest defining binge-watching as watching more than three episodes in one sitting, rather than two, as following the traditional television programming, which regularly includes two-part episodes. Hence, the researchers imply that a refinement of the definition would benefit the research field. The new definition should focus on finding a consensus on “*cut-offs of time and/or the number of episodes*” (Walton-Pattison, Dombrowski, & Presseau, 2018, p. 22).

Most of the existing research raises the question of whether binge-watching has been defined well enough. Hence, this study will focus on the time spent watching VOD content and whether this increases under specific circumstances.

Research regarding the predictors of an increased watching time is still very limited. However, as VOD-watching is becoming more and more prevalent, it is important to investigate possible motives leading to such behaviour. Netflix itself states on their website that consumers of their VOD service engage in watching in order “*to relax, enjoy a shared experience with friends and family, or [because they are] bored*” (Netflix, 2018), indicating a broad range of motivations and predictors of VOD consumption. Similarly, the study by Steiner and Xu (2018) identified cultural inclusion in terms of interacting with others and relaxation as reasons for an increased amount of watching time. Additionally, catching up, sense of completion and an improved viewing experience were found as motivational factors for users to watch.

Moreover, Flayelle et al. (2019) identified motives for engaging in VOD-watching based on two questionnaires. The “Watching TV Series Motives Questionnaire” (WTSMQ) incorporates four motivational factors involved in VOD-streaming behaviour, including coping or escapism, enrichment, emotional enhancement and social factors. A factor analysis for the “Binge-Watching Engagement and Symptoms Questionnaire” (BWESQ) identified motives of engagement, positive emotions, desire/savouring and pleasure maintenance. It is suggested that watching TV series as a leisure activity can lead to improvements of feelings and well-being, as a result of satisfying the need for entertainment (Flayelle et al., 2019). According to Zillmann’s mood management theory (1998), people are prone to select certain media to increase or maintain a positive mood and intuitively rearrange their surroundings to

maximise positive emotions. Based on this theory, individuals who search for mood enhancement in VOD-watching are likely to engage in an increased behaviour on a regular basis and incorporate it into their daily routines. In line with this, as cited in Steiner and Xu (2018), Rubin (1983, 2002) suggests that lower levels of activity, such as experienced in relaxation, escape and passing time, are associated with ritualised media use. Hence, individuals who engage in media on a regular basis are likely to experience lower activity levels.

One possible determinant of VOD-watching, which has not yet been explored concerning its link to VOD-watching, is exhaustion. In general, the concept of exhaustion can be defined as "*a feeling of being emotionally overextended and exhausted by one's work/studies. It is manifested by both physical fatigue and a sense of feeling psychologically and emotionally 'drained'.*" (Wright & Cropanzano, 1998, p. 486). Accordingly, it can be linked to high demands in different settings, for instance in the job or in university. The connection between an increased VOD-streaming time and exhaustion in terms of mental or emotional exhaustion is unexplored by research until now.

The study by Reinecke and Hofmann (2016) investigated the relationship between media use and the state of mental and physical exhaustion, using the experience sampling method. The most frequent media used in this sample was the internet, followed by television watching. Participants mentioned streaming services as the second most common category used throughout periods of using internet services. The results indicate a positive correlation between media use for recovery and exhaustion. Hence, the results suggest a situational state influence on media use in terms of a tendency indicating a higher media use when experiencing exhaustion. Furthermore, the results imply that situational well-being is enhanced by recovery-related media use since the individual experiences increased media entertainment (Reinecke & Hofmann, 2016).

A similar study by Zacher, Schmitt, Jummieson, and Rudolph (2019) found a relationship between positive mood and emotional exhaustion. Individuals who are in a positive mood are less mentally exhausted compared to people in a negative mood. People who are mentally exhausted are likely to be in need of mood enhancement in order to feel less exhausted. In line with the mood management theory, emotionally exhausted individuals are more likely to engage in an increased VOD watching time due to the need for mood enhancement.

In line with this, a mediating relationship between mood and emotional exhaustion was found by Teuchmann, Totterdell and Parker (1999). In this study time pressure indirectly

affected mental exhaustion through mood. Greater time pressure leads to a negative mood which increases mental exhaustion. Applied to the field of VOD consumption, it could be suggested that the individual may perceive engagement in VOD-streaming content to increase mood and thereby indirectly influence mental exhaustion. At the same time, if streaming VOD-content leads to a negative mood it likely increases the perceived emotional exhaustion.

The evidence clearly suggests that VOD consumption can be related to an individual's well-being. However, the relationship is not clear-cut. It seems that VOD watching can be linked both positively and negatively to well-being (Granow, Reinecke, & Ziegele, 2018). On the one hand, as long as the individual perceives autonomy in terms of deciding what to watch or what to engage in during their leisure time, streaming VOD content may influence well-being positively. On the other hand, if the VOD-streaming interferes with certain goals or tasks are neglected, it will be negative for well-being, due to feelings of guilt. Accordingly, VOD consumption is perceived as influencing well-being positively in terms of media entertainment. However, this effect will decline when certain obligations are neglected (Granow, Reinecke, & Ziegele, 2018).

Until now most studies have investigated the phenomenon of VOD-watching using cross-sectional, retrospective survey measurements. However, oftentimes cross-sectional study designs as well as retrospective assessments lead to insufficient or biased data (van Berkel, Ferreria, & Kostakos, 2017). Therefore, this study will make use of the experience sampling method (ESM). This method enables a more accurate and less biased measurement of the phenomenon of VOD-watching (van Berkel et al., 2017). It provides the opportunity to detect changes in watching behaviour over time as well as relations between certain variables. ESM decrease the dependence on participants' long-term memory as questionnaires are provided close in time to the occurrence of the actual behaviour or state (van Berkel et al., 2017). This feature is especially useful when collecting data regarding the mood states such as happiness or exhaustion. By using ESM, a more accurate picture about changes over the day in mood can be provided and analysed, which is especially useful to investigate relations of mood and VOD consumption. Moreover, since mobile devices are common, ESM is a useful and easily implemented method for longitudinal data collections independent of specific settings. Due to the longitudinal and situational nature of data collection, the ESM method shows high levels of ecological validity, reliability, as well as the possibility to inspect watching patterns of participants compared to a cross-sectional study design (van Berkel, et al., 2017; Myin-Germeys et al., 2009).

## The current study

Based on the theoretical framework, this study will focus on two research questions. The theoretical model is visualised in figure 1. Firstly, the question “To what extent is mental exhaustion associated with the amount of VOD- watching?” will be examined by evaluating the following hypothesis:

*Hypothesis 1: Individuals who feel mentally exhausted show an increased time of VOD-watching behaviour.*

*1 a. This relationship is moderated by the expected mood increase through VOD-watching. Individuals who expect that watching VOD-streaming content will lead to a better mood will engage in more VOD-watching when exhausted.*

*1 b. Contrarily, individuals who do not expect to feel better after VOD-watching, will engage in less VOD-watching, when exhausted.*

This hypothesis is proposed since individuals who feel exhausted due to high demand in their professional setting are suggested to be in need of mood enhancement. If individuals expect a mood enhancement through streaming VOD content, they are likely to engage in increased watching behaviour during times of mental exhaustion. However, if the individual does not believe in such an effect, an increased amount of VOD-streaming is less likely.

Secondly, this research will investigate the question: “To what extent is streaming VOD content related to well-being?”. Therefore, the following hypothesis will be examined:

*Hypothesis 2: The amount of streaming VOD content is negatively associated with an individual’s perceived well-being.*

*2a. This relationship is moderated by perceived task neglect. Individuals who are neglecting other obligations while engaging in binge-watching behaviour will experience poorer well-being afterwards.*

*2b. Individuals who are not neglecting other obligations will experience heightened well-being after engaging in VOD-watching behaviour.*

This hypothesis is proposed as individuals are expected to experience heightened well-being due to a perceived autonomy without having the feeling of neglecting important life-obligations. However, if tasks or obligations are neglected due to binge-watching, the individual is likely to perceive feelings of guilt, which in turn will lower the well-being.



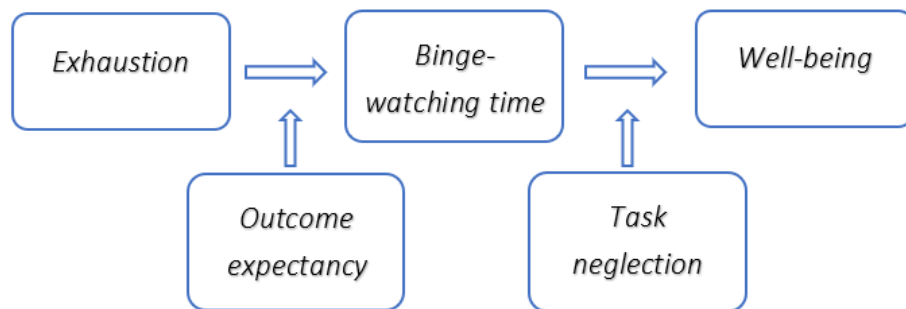


Figure 1: Theoretical model

## Methods

### Participants

The study involved 45 (64.4% female, 35.6% male) participants, aged between 17 and 30 (Mean age= 22.69; SD age= 2.34). The participants had different nationalities, including German (91.1%), Dutch (2.2%) Kurdish (2.2%) and Mexican (2.2%). Most participants were students (84.4%), five individuals worked as full-time employees (11.1%), four individuals indicated their occupation as a part-time employee (8.8%) and two participants were pupils (4.4%). Some participants indicated two occupations. The participants were recruited using convenience sampling either via social contacts or via the SONA platform, where students of Psychology or Communication studies at the University of Twente could assign themselves to the study. The participation was voluntary but facilitated by providing an incentive in the form of SONA-credits. SONA-credits are mandatory to obtain for students studying Psychology or Communication studies throughout their Bachelor programme. The study was approved by the Ethics Committee of the University of Twente. Every participant agreed to an online active informed consent (Appendix 1.4) prior to the participation, fulfilling the guidelines of this committee.

### Design

To measure the daily real-life watching behaviour of participants, an experience sampling method (ESM) design was chosen. Participants were assessed daily using three short questionnaires about their mood and one questionnaire for watching-behaviour in the last 24 hours over the course of two weeks. Interval contingent sampling was used, meaning that participants were assessed at fixed time points throughout the day (Conner & Lehmann, 2007). This sampling method was chosen to ensure that a constant mood pattern is assessed.

This also allows for comparisons between the days. Accordingly, respondents were assessed in the morning (9 a.m.), in the afternoon (3 p.m.) as well as in the evening (9 p.m.). The study took place between the 29th of April and 13th of May 2019, hence, the study length was 15 days, which is described as the average study length for ESM studies (van Berkel et al., 2017). Additionally, the quality of data is likely to decline after 2-4 weeks (Stone, Kessler, & Haythomthwatte, 1991). By assessing 15 days of viewing, watching patterns or cycles could be easily examined without causing too much inconvenience for the participants. Due to the high number of repeated measurements throughout the week, a small sample size of about 30 participants is generally considered sufficient for reliable estimates in ESM studies (Kreft & de Leeuw; 1998).

## **Procedure**

Subsequent to the approval given by the Ethics Committee of the University of Twente, participants were recruited. The gathering of participants was done via social contacts and SONA, the test subject pool of the University of Twente. The participants were informed about the longitudinal nature of the study. After signing up online, they received a confirmatory email (Appendix 1.1) which contained more detailed information and a step-by-step guide for downloading the TIIM app and the following procedure. They also received a confirmatory email after creating an account and signing in on the app (Appendix 1.2). Participants were allowed to withdraw from the study at any time, without giving a reason.

All participants were assigned to four questionnaires each day over a time period of 15 days. A baseline questionnaire was administered on day one. Three of the daily questionnaires assessed the participant's current mood, while the fourth of them was designed to determine the participants watching behaviour in the last 24 hours as well as the perceived neglect of daily tasks. The mood questionnaires were online available at 9 a.m., 3 p.m., and 9 p.m. and disappeared after 6 hours, while the behaviour questionnaire was published at 9 a.m. and disappeared 15 hours later. The participants received notifications on their mobile device as soon as the modules were made available and 2 hours afterwards, if they had not been answered by then. Furthermore, the researchers monitored the response rates and contacted individual participants who did not respond regularly via Email and TIIM notifications (Appendix 1.3). After the data collection was finished (15 days), participants were informed about the aim of the study and received the SONA credits.

## Materials

This research project was part of a joint effort of four individual bachelor-projects regarding VOD-watching behaviour. For this study, only the measures used to investigate the relation between exhaustion and watching behaviour and the consequences for well-being were used. The utilized questionnaires were the baseline (one assessment in the beginning), the retrospective assessment (one assessment a day) and the momentary assessment (three assessments a day).

All questionnaires were provided to the participant via the TIIM application of the University of Twente (BMSlab University of Twente, n.d.). The application provides opportunities for researchers to create questionnaires with various answer categories as well as interventions for participants. The software is based on the LimeSurvey software, however, with an improved backend to enable and facilitate new functionalities (BMSlab University of Twente, n.d.). To answer the questions, participants were asked to use their own mobile phones (iOS and Android).

**Baseline questionnaire.** The baseline questionnaire included six different questions. First, participants were asked to indicate their age, gender (male/female/other), their occupation (pupil/student/employed full-time/employed part-time/unemployed/other) and their nationality (German/Dutch/Other). To gain an overview of the used VOD streaming platforms, the question “*Which video-streaming-platform(s) do you use on at least a weekly basis?*” (Answers: YouTube/Netflix/Amazon Prime/Hulu/HBOgo/Other) was asked.

The fifth question targets the participant’s expectations of their mood after watching VOD sessions. Participants were asked to indicate their agreement to the statement “*Generally, I am in a better mood after binge-watching.*” on a 5-point Likert scale. The answer categories range from “*strongly agree*” to “*strongly disagree*”. The whole questionnaire took participants approximately 3 minutes.

**Retrospective assessment.** The retrospective assessment, including 18 items, measured amongst others the participants watching behaviour in the last 24 hours retrospectively by asking three specific questions about the total time watching behaviour on VOD streaming platforms. In addition, other variables such as the context and genre of watching, reasons for watching as well as feelings after watching were included. The first question was “*Did you watch video-streaming content?*”, which had to be answered by indicating “*yes*” or “*no*”.

The second question targeted the number of episodes watched by asking “*How many episodes did you watch?*”. The answer categories ranged from “*less than one episode*” to

“*more than seven episodes*”. The episodes were coded to fit the number of episodes indicated. Hence, for instance, “*one episode*” was translated into 1 and “*two episodes*” was coded as a 2. The answer possibility “*less than one episode*” was coded as 0.5 and the category “*more than seven*” was translated into 7.5. Special answer categories were “*I did not watch*” and “*I watched a movie(s)*” which both were translated into a 0 while coding.

The third question was “*how many minutes did you watch?*”, which could be answered on a drop-down scale from “*I did not watch*”, over the interval between “*1-30 minutes*” to “*more than seven hours*” in steps of 0.5 hours (0.5 hour, 1 hour, 1.5 hours, 2 hours, 2.5 hours, etc.). Watching time was coded in minutes. The first answer category “*1-30 minutes*” was translated into a 15. After that each category was translated in minutes, for instance, “*1 hour*” was translated into 60, “*1,5 hours*” was coded into 90. The answer possibility “*I did not watch*” was coded as a 0.

The respondents were not expected to know exactly how much time they spend watching. Instead, they were asked to indicate the best fitting time frame. A broad subdivision of 30-minute intervals was chosen, the individual would indicate the cumulative watching time. A 30-minutes interval is a typical length for an episode of a series (Rigby, Brumby, Cox, & Gould, 2018), which should facilitate the estimations of watching time.

**Task neglect question.** Part of the retrospective assessment was the examination of retrospectively perceived task neglect. By using a number slider, participants could indicate the extent of neglect of daily tasks, answering the question “*To what degree did you neglect responsibilities/obligations of your daily life?*”. Answer categories range from “*not at all*” (1) to “*very much*” (10).

**Momentary assessment.** In order to get an overview of states experienced by the participants throughout the day, participants were asked to answer three items regarding their well-being and level of exhaustion three times a day using an interval of 4 to 5 hours. Reminders were sent to the participants after two hours to reduce the probability of missing data.

Assessing subjective well-being using ESM enables to detect changes in happiness, but also captures the current experienced level of happiness throughout the day (Huang, 2008). Well-being was measured by two items. First of all, participants were asked to indicate their current mood using an emotion quadrant (Appendix 5). The quadrant makes use of two dimensions, namely pleasure-displeasure and arousal-sleepiness, which are based on the circumplex model of affect developed by Russell, Weiss and Mendelsohn (1989). Previous studies used the quadrant for instance for measures of well-being in daily life (Möwisch,

Schmiedek, Richter, & Brose, 2018) as well as of core affect (Inkinen, Lonka, Hakkarainen, Muukkonen, Litmanen, & Salmela-Aro, 2014). These studies have shown that the emotion quadrant can be used as a reliable measure of well-being and affect in daily life situations. Accordingly, the emotion quadrant was used as a measurement in this ESM study. To facilitate the use of the quadrant, an instruction was added describing how to use it correctly. The scores can range from -100 to 100 and are presented in coordinates (pleasure, arousal).

The emotion quadrant was supplemented with an item which measured the level of happiness experienced explicitly. By using a number slider, individuals are able to answer the item "*Right now, I am happy.*". Answer categories are ranging from "*not at all*", indicated by using the number one, to "*very much*", indicated by using the number 10. The item used in this study was reformulated based on ESM fundamentals, which suggest that single diary items are to be used since they measure states rather than traits, imitate an internal dialogue and are effortlessly comprehensible (Delespaul, 1995). Further items were formulated in a similar way due to ensure a manageable and simple usability.

Another area of interest was mental exhaustion. In order to simplify the measurement as well as reducing the workload for participants, a single item was used. This was an adaption of the ESM fundamentals (Delespaul, 1995). Exhaustion was measured by the item "*Right now, I feel exhausted.*", which was derived from the Maslach Burnout Inventory (MBI) item focused on emotional exhaustion (*I feel mentally exhausted from my work*), which showed a factor loading of .75 (Sonnenschein, Mommersteeg, Houtveen, Sorbi, Schaufeli, & Doornen, 2007). This item was already used in an ESM study by Sonnenschein, et al. (2007) in order to measure momentary exhaustion. Accordingly, it was used for this study as well. Participants could indicate their level of exhaustion by using a number slider ranging from 1 ("*not at all*") to 10 ("*very much*"). To ensure the participant's understanding of the concept of exhaustion a description was added. Exhaustion was defined as "*a feeling of being emotionally overextended and exhausted by one's work/studies. It is manifested by both physical fatigue and a sense of feeling psychologically and emotionally 'drained'.*" (Wright & Cropanzano, 1998, p. 486).

## **Data Analysis**

The data gathered through the TIIM application was analysed using the IBM SPSS Statistics Suite (version 24). Descriptive statistics were used to describe the information given in the baseline questionnaire, for instance, demographics, watching-time in total and outcome expectancy of mood after watching VOD-streaming content. Observations on the variable

exhaustion were moved one cell up in the dataset. Accordingly, this allowed to include exhaustion as a predictor of watching time as the indicated watching time no longer preceded the measurement of exhaustion.

The data collected through the momentary questionnaires, namely the variables measuring the level of exhaustion and happiness daily, means were computed by using Microsoft Office Excel (version 1904). Each participant obtained one value per variable, summarising his/her daily average level of happiness and exhaustion. Regarding the data gathered through the emotion quadrant, coordinates were split into two variables, namely level of pleasure and level of arousal. For each of these variables, a daily mean was computed.

Due to the longitudinal nature of the data set, a series of Linear Mixed Model (LLM) analyses with an autoregressive covariance structure was conducted. This model is able to take the unique nested structure of longitudinal data into account. Missing data was taken into consideration in the linear mixed model analysis by the calculation of estimated marginal means. The dependent variables in each linear mixed model analyses were the time individuals spend in VOD-streaming content, the perceived neglect of daily obligations, as well as the daily means of exhaustion, happiness, pleasure and arousal. The time point, as well as the subject ID, were set as fixed independent factors. The output provided estimated means for each dependent variable per time point and per participant. The estimated means were used for further analyses.

First, Microsoft Office Excel was used for exploratory graphical analyses of the relationships between variables. The estimated marginal means per participant as well as per time point were used subsequently to compute correlations between the used variables. Correlations were interpreted according to Cohen (1998). A weak correlation is considered by a correlation coefficient of .10, a moderate relationship is suggested at .30 and a strong correlation is set when the correlation coefficient is higher than .50.

After the calculation of estimated marginal means, a series of multivariate regression analyses was conducted to analyse the relations between the variables of interest. A multivariate regression was used to investigate the relationship of exhaustion and outcome expectancy and on watching time. In this analysis, exhaustion, outcome expectancy as well as their interaction (exhaustion\*outcome expectancy) act as independent variables whereas watching time acts as the dependent variable (Baron & Kenny, 1986).

The second moderation of the theoretical model was similarly evaluated. A multivariate regression analysis measured the effect of perceived task neglect on the association between watching time and well-being. Hence, perceived task neglect and

watching time act as an independent variable. Both variables also operate in an interaction term (perceived task neglect\*watching time) to model the interaction effect on well-being. The variable well-being is entered as the dependent variable (Baron & Kenny, 1986).

For all analyses, a significance level of .05 was used, meaning accepting a probability of about 5% of rejecting the null hypothesis even though there is no effect present in the data.

## **Results**

A number of 45 students completed the ESM study on a regular basis. One participant, who was not able to answer more than two of the 59 questionnaires, was omitted from the dataset before analysing the data. In total, 72% of the administered questionnaires were completed during the 15 days of measurement.

### **Observed expectations, watching behaviour and mood**

In the baseline questionnaire, participants had to indicate their expectancy concerning how they feel after watching VOD-streaming content. A mean of 3.08 (SD= .67) was observed on a scale from 1 to 5, indicating that on average the individuals were either unsure or have a neutral opinion about their feelings after watching VOD content. Personal scores varied from 2 to 4. No extreme answers were given regarding the expectation to be in a better mood after watching VOD content. A question targeted the VOD streaming platforms used on a daily basis. In the sample, 87% of individuals indicated that they watched Netflix on a weekly basis. 77% of the sample reported to use YouTube and 35% used Amazon Prime Video on a weekly basis. Minor streaming platforms indicated by participants were, for instance, Sky go, Vivo, and Kinox.

The retrospective measurement asked participants once a day about their watching behaviour, and their perceived obligation neglect. In this sample, participants reported watching VOD-streaming content on about 10.8 days (72%) of the 15 days. On average, 86.06 minutes (SD= 51.67) watching time of VOD-content was observed per individual per day. Accordingly, as seen in table 1, individuals watched around 1.43 hours (SD=.86) a day. Moreover, participants watched 1.76 episodes (SD= 1.32) a day on average. On average, the perceived obligation neglect was 3.26 (SD= 1.87) and daily averages ranged on a personal level from 1.31 to 6.54 on a scale of 1 to 10. This indicates that individuals in this sample experienced little neglect of obligations.

The momentary measurement asked participants to indicate their mood throughout the day. The personal averages of exhaustion ranged from 2.46 to 7.66 with an overall mean of

4.63 (SD= 1.03) on a scale from 1 to 10. The mean average level of happiness per person differed on a range from 4.56 to 9.04. An overall mean of 6.42 (SD=.94) was observed on a scale of 1 to 10. The emotion quadrant indicated a personal average of pleasure ranging from -17.72 to 68.15 with an overall average pleasure level of 25.01 (SD= 18.14). Regarding the individual's arousal level, an overall mean of -6.78 (SD= 17.03) was observed with a personal mean that ranged from -41.99 to 56.68. Both scales ranged on a scale from -100 to 100.

Table 1

*Marginal estimated means per participant*

Variable	Personal average minimum	Personal average maximum	Overall average	Standard deviation	Scale minimum	Scale maximum
Watching time [minutes]	8.5	223.50	86.06	51.67	0	8
Episodes	0.11	6.25	1.75	1.32	0	8
Obligation neglection	1.28	6.59	3.23	1.21	1	10
Daily exhaustion	2.46	7.66	4.63	1.03	1	10
Daily happiness	4.56	9.04	6.42	0.94	1	10
Daily pleasure	-17.72	68.15	25.01	18.14	-100	100
Daily arousal	-41.99	56.68	-6.78	17.03	-100	100



### **Covariation over time and people (LLM)**

A series of linear mixed models was executed with the subject ID and the time point as fixed factors (Table 2) to estimate means for further analyses. Covariates were added based on the presumed link to the dependent variable. In all analyses, the fixed factor subject ID was significant, indicating that there were significant differences between the participants in relation to the dependent variable. Outcome expectancy was not included in the linear mixed models due to the fact that the variable was only measured at baseline.

Table 2

*Results Linear Mixed Models with covariates*

Dependent	Fixed factors	Covariates	F-value (df1, df2)	p-value
Watching time	Subject ID		5.113 (44, 146.669)	<b>&lt;.001</b>
	Time point		1.019 (13, 306.645)	.432
		exhaustion	.005 (1, 476.633)	.946
Exhaustion	Subject ID		5.937 (44, 142.139)	<b>&lt;.001</b>
	Time point		1.678 (13, 313.798)	.064
		Watching time	.651 (1, 476.496)	.927
Happiness	Subject ID		5.510 (44, 119.558)	<b>&lt;.001</b>
	Time point		1.283 (13, 271.438)	.223
		Watching time	4.293 (1, 475.284)	<b>.039</b>
		Obligation neglection	7.369 (1, 459.711)	<b>.007</b>
Obligation neglection	Subject ID		4.267 (44, 95.578)	<b>&lt;.001</b>
	Time point		1.547 (13, 270.723)	.101
		Watching time	50.770 (1, 442.355)	<b>&lt;.001</b>
		Happiness	7.759 (1, 465.787)	<b>.006</b>
Pleasure	Subject ID		4.220 (44, 128.866)	<b>&lt;.001</b>
	Time point		1.478 (13, 283.206)	.125
		Watching time	5.221 (1, 476.151)	<b>.023</b>
		Obligation neglection	3.571 (1, 452.171)	.059
Arousal	Subject ID		3.799 (44, 142.752)	<b>&lt;.001</b>
	Time point		1.113 (13, 355.810)	.346
		Watching time	.932 (1, 478.139)	.335
		Obligation neglection	2.172 (1, 416.053)	.141

To check whether exhaustion is a predictor of watching time. The daily exhaustion mean was adjusted to be in line with the watching time of the same day. Since the question for exhaustion targeted the individual's level of exhaustion in a momentary assessment and the question for watching time was asked in a retrospective fashion, the data was adjusted, so exhaustion could be used as a predictor. Accordingly, the exhaustion level of today was used to the same days watching time. A linear mixed model analysis with watching time as a

dependent variable and exhaustion as a fixed covariate was used. The covariate turned out to be non-significant [ $F(1, 476.633) = .005$ ;  $p = .946$ ]. Exhaustion as a covariate and watching time were not linked. This result is a first indication that not enough evidence for hypothesis 1 is available. Additionally, the analysis of exhaustion showed that in the sample, the level of exhaustion tended to increase over the time, however, not yet statistically significant [ $F(13, 313.798) = 1.678$ ,  $p = .064$ ].

Additionally, the linear mixed model involving the daily happiness mean as a dependent variable and the perceived neglect of obligations as well as watching time as fixed covariates was conducted. The model indicated the neglect of obligations as well as the watching time as a significant covariate [ $F_{\text{obligation neglect}}(1, 459.711) = 7.369$ ,  $p = .007$ ] [ $F_{\text{watching time}}(1, 475.284) = 4.293$ ,  $p = .039$ ]. The results indicate that the perceived neglect of obligations and the watching time were associated with daily happiness scores. Similarly, this was confirmed when using obligation neglect as dependent variable. Both covariates, happiness and watching time, are significantly related to the neglect of obligations [ $F_{\text{watching time}}(1, 442.355) = 50.770$ ;  $p < .001$ ] [ $F_{\text{happiness}}(1, 465.787) = 7.759$ ;  $p = .006$ ]. First evidence points in favour of hypothesis 2, 2a and 2b. Accordingly, these relations are explored in more detail.

Almost identical results were seen in a linear mixed model in which pleasure was the dependent variable. The covariate watching time [ $F(1, 476.151) = 5.221$ ;  $p = .023$ ] tended to be related to pleasure, although the p-value of perceived obligation neglect [ $F(1, 452.171) = 3.571$ ;  $p = .059$ ] was low, but not yet significant.

### Post-hoc correlations

Simple post-hoc correlations were employed to examine the relationship between the variables further. Two perspectives were used to explore the associations. Correlations using means of each participant as well as the means per time point. The participant level is focused on the mean of all days per participant whereas the time point level incorporates the means per day of all participants.

Table 3

*Correlation between variables per participant*

	(1) Watching time (daily)	(2) Exhaustion (daily)	(3) Happiness (daily)	(4) Outcome expectancy (baseline)	(5) Obligation neglection (daily)	(6) Pleasure (daily)	(7) Arousal (daily)
1		-.010	-.112	<b>.338*</b>	.054	.064	.032
2			-.275	-.097	<b>.300*</b>	<b>-.337*</b>	<b>-.507**</b>
3				.025	-.211	<b>.537**</b>	.273
4					.081	-.074	<b>-.417**</b>
5						-.164	-.090
6							<b>.445**</b>

*Note.* \*  $p < .05$  level (2-tailed); \*\* $p < .01$  level (2-tailed).

Table 4

*Correlations between variables per time point*

	(1) Watching time (daily)	(2) Exhaustion (daily)	(3) Happiness (daily)	(4) Obligation neglection (daily)	(5) Pleasure (daily)	(6) Arousal (daily)
1		-.179	.167	.075	.215	.468
2			<b>-.594*</b>	<b>.536*</b>	<b>-.544*</b>	<b>-.757**</b>
3				-.371	<b>.720**</b>	<b>.573**</b>
4					-.202	<b>-.682**</b>
5						.421

*Note.* \*  $p < .05$  level (2-tailed); \*\* $p < .01$  level (2-tailed).

Considering the high correlation between happiness and pleasure on individual level and over time, both concepts appear to be very similar and resemble a similar construct of well-being (table 2; table 3). Therefore, the results will focus on happiness as a measure of well-being.

To further examine the results of the linear mixed models, simple correlations were computed. A Pearson's correlation was computed to test the assumption that the perceived neglect of obligations would be negatively correlated with happiness per participant. There was a non-significant, negative correlation between the two variables ( $r = -.211$ ,  $n = 45$ ,  $p = .165$ ), indicating that individuals who have a high daily level of happiness tend to experience less neglect obligation (figure 2).

From the time point level, another Pearson's correlation analysis was used to observe the relationship between the same variables per day. A moderate, but, again, no significant association could be identified ( $r = -.371$ ,  $n = 14$ ,  $p = .192$ ). Accordingly, the higher the level of happiness over all time points, the lower the overall perceived neglect of obligations tended to be (figure 3).

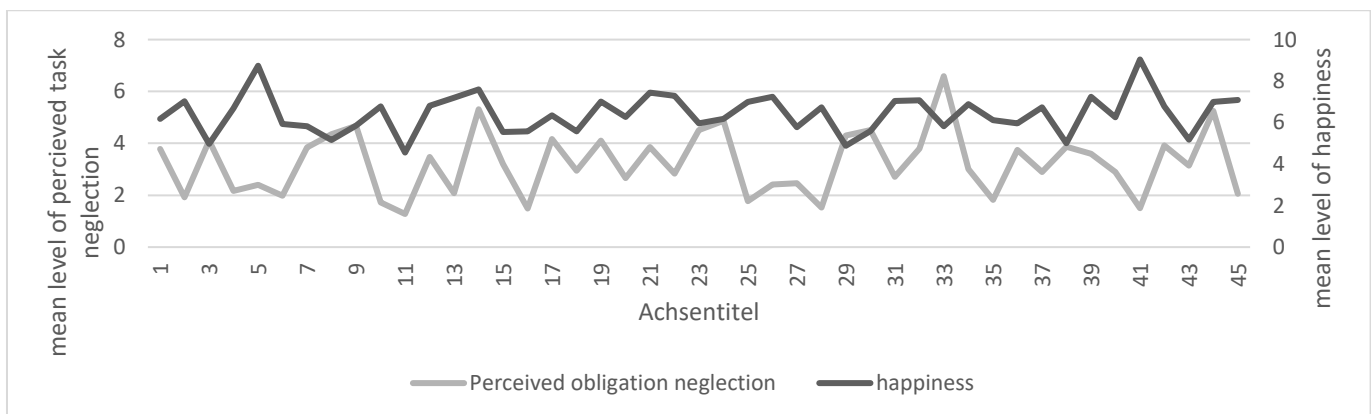


Figure 2: Mean level of happiness (dark grey) and mean level of perceived neglection of obligations (light grey) per participant.

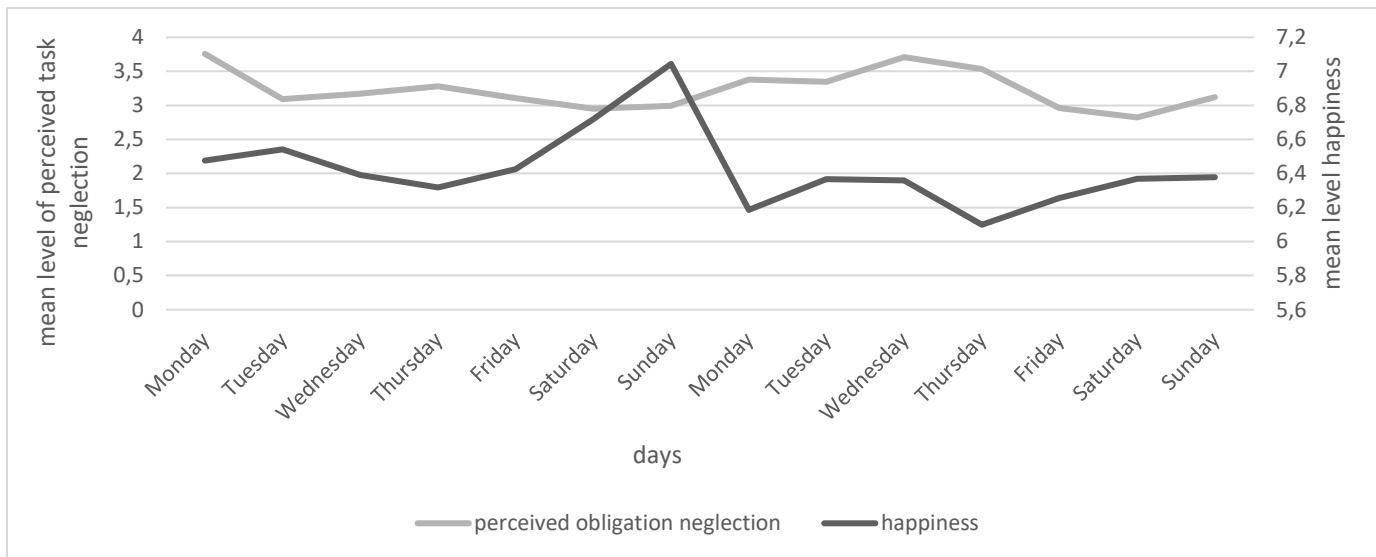


Figure 3: Mean level of happiness (dark grey) and mean level of perceived obligation neglection (light grey) over the time points.

To assess the relationship between watching time and happiness per participant, another Pearson’s correlation analysis was computed. The correlation was a weak and non-significant ( $r = -.112$ ,  $n = 45$ ,  $p = .464$ ) (figure 4).

The same analysis with the same variables was employed for observations per time point. Only a weak correlation was identified between the level of happiness and the time watched per day ( $r = .167$ ,  $n = 14$ ,  $p = .569$ ) (figure 5).



Figure 4: Mean level of watching time in hours (dark grey) and mean level of happiness (light grey) per participant.

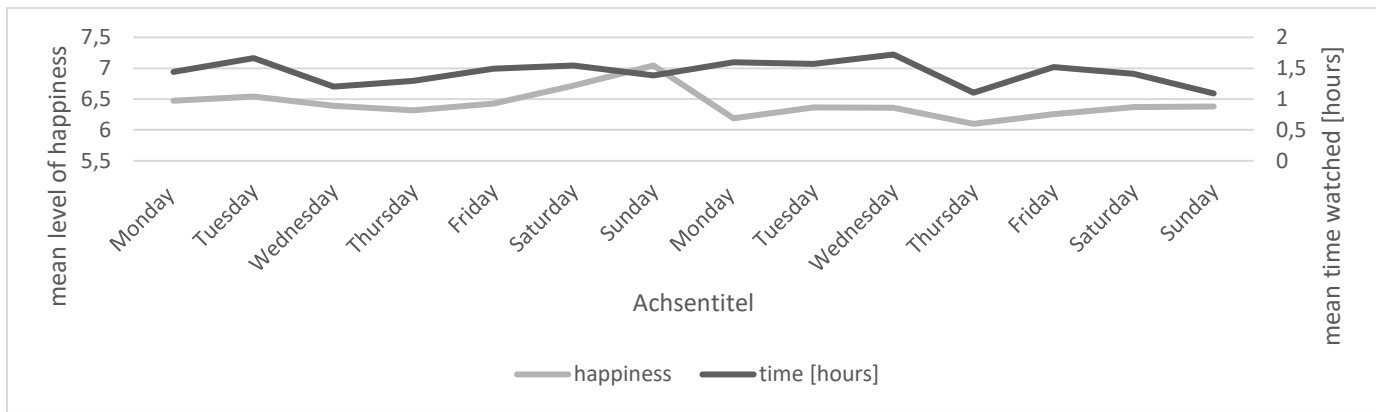


Figure 5: Mean level of watching time in hours (dark grey) and mean level of happiness (light grey) per time point.

Since the outcome expectancy was assessed only once in a baseline questionnaire, it was not used as a covariate in a linear mixed model. Accordingly, only a Pearson's correlation was employed to check the relationship between the variable outcome expectancy and watching time between individuals. There was a significant positive and moderate correlation between outcome expectancy and watching time ( $r=.338$ ,  $n=45$ ,  $p=.023$ ), indicating that participants who expect a positive outcome after VOD-watching tended to watch more VOD content (figure 6).

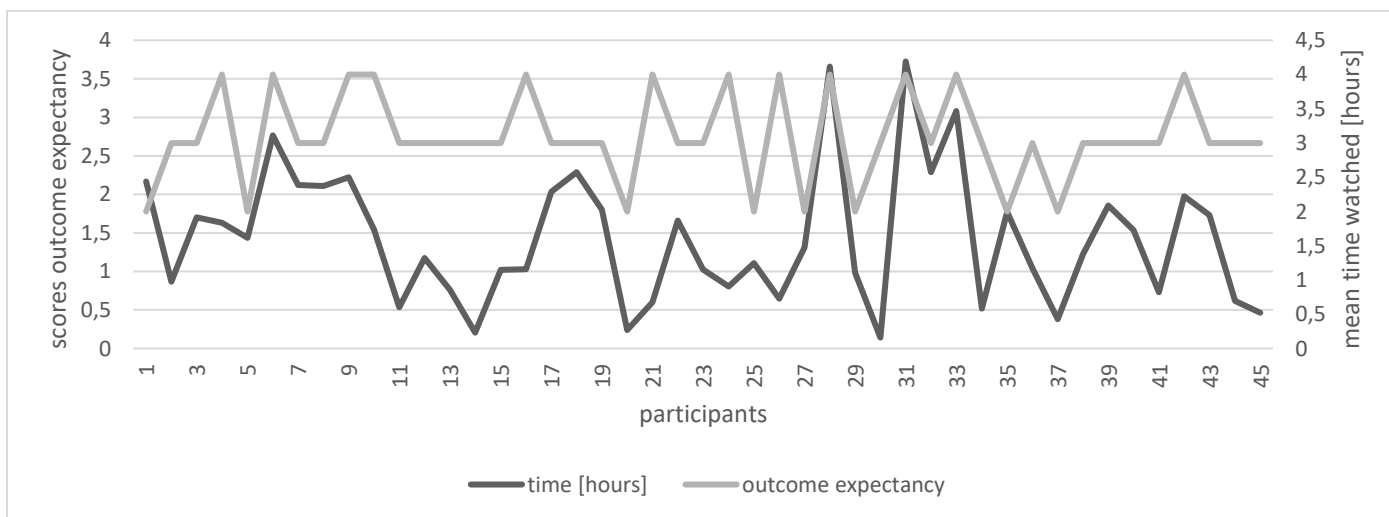


Figure 6: Mean level of watching time (dark grey) and individual scores of baseline outcome expectancy (light grey) per participant.

### **Interaction effects between variables**

To test a potential interaction effect of exhaustion and the individual's outcome expectancy, a multivariate regression was conducted. For this analysis, the marginal estimated means per participant were used. An interaction effect was modelled, which had no significant effect [ $F(3, 41) = 1.995$ ;  $p = .130$ ]. The total  $R^2$  of the model was .127, meaning 12.7% of the variance in the dependent variable could be explained by the model at hand. Respectively, the interaction of exhaustion and outcome expectancy was also no main predictor of time individuals watched VOD content. This result is in line with the correlation analysis as well as the linear mixed model. There was not enough evidence to reject the null hypotheses. Hence, no effect was found in the sample confirming hypothesis 1, 1a and 1b.

To examine the interaction effect of watching time and the perceived neglect of obligations, a multivariate regression was utilised. The results indicate that no interaction effect was present [ $F(3,40) = .816$ ;  $p = .493$ ]. The  $R^2$  of the model was .058, meaning that 5.8% of the variance in the dependent variable could be explained by the model. Accordingly, the perceived neglect of obligations as well as the watching time did not affect the level of happiness. Due to this result, the null hypotheses could not be rejected in favour of the hypotheses 2, 2a and 2b. It appears, that no effect could be identified in the sample, concerning these three hypotheses.

### **Discussion**

In this study predictors as well as consequences of VOD streaming behaviour were investigated using ESM. In a nutshell, the results indicated that exhaustion was not a predictor for watching time. However, the expectation to feel better after watching was positively associated with watching time later on, indicating that baseline outcome expectancy is a significant covariate of the amount of VOD-watching. Happiness, obligation neglect and watching time seemed to be related based on linear mixed model analyses. However, conventional statistical procedures were not able to confirm any robust effects.

Exhaustion was hypothesised to be a predictor of increased watching time. However, this expectation could not be confirmed. In the sample, the daily level of exhaustion was not related to an increased watching time. Although the relationship between exhaustion and VOD-streaming behaviour is rather unexplored, this result was unexpected. A study by Reinecke and Hofmann (2016) indicated a relation between increased media use, including VOD services, and feeling mentally exhausted. The participants appeared to engage more strongly in media, in order to recover from exhaustion. Moreover, based on the research by



Zacher, Schmitt, Jummieson, and Rudolph (2019) it was assumed that individuals who are mentally exhausted search for recovery to enhance mood. However, in this sample, recovery from exhaustion seemed to have a different effect on the participants' behaviour. Instead of engaging in watching behaviour when being exhausted, individuals may search for other ways of mood increasing processes, even if mood enhancement through binge-watching is expected by the individuals.

This could be explained through different processes. It might be the case that individuals who experience feelings of exhaustion are not able to actively process the episode or movie as their cognitive capacities/resources are depleted. However, one can assume that individuals want to watch VOD content attentively out of curiosity and interest in how the storyline will proceed. This assumption is in line with the results found by Pittman and Sheehan (2015), who suggest that engagement in the story and the characters is the strongest motive for watching VOD content. Accordingly, a commitment to a series rises with the level of engagement, which in turn increases the frequency of watching behaviour. Moreover, Flayelle et al. (2019) indicated that social factors also play a role in streaming habits on platforms such as Netflix. Individuals could have an intention to watch a certain series to relate to others in conversations. Therefore, being active and attentive may be a requirement which cannot be fulfilled when being exhausted. Accordingly, watching VOD-streaming content may not be the first-choice coping mechanism employed to recover from mental exhaustion, when individuals want to actively and attentively follow the storyline.

Another reason which can explain this result could be that the concept of exhaustion is not directly linked to mood enhancement, but to levels of energy. Accordingly, exhausted individuals might be prone to increase energy levels, for instance by sleeping, instead of engaging in a low energy activity such as watching online streaming content. A moderate correlation per time point between the daily level of arousal and watching time has been identified. Accordingly, on days where the daily level of arousal was generally low, the overall watching time tended to be low as well.

The findings showed that there was a link between the expectancy of the outcome after watching. Thus, individuals who believe to be feeling better after watching are prone to engage longer in VOD-streaming content compared to participants who generally do not feel better after watching. While this relationship does not appear to be linked to exhaustion directly, it is a direct predictor for an increased watching behaviour itself. This link is in line with the findings of other research and theories. The mood management theory states that people engage in media in order to maintain or enhance a positive inner state (Zillmann,

1998). The results of this study confirm that individuals who expect to feel better after watching also engage more often in such behaviour in the future.

It seems that exhaustion itself is not a good predictor of watching time. However, the desire for mood improvement appears to be more constant. Even though the literature has not explored this phenomenon so far, this assumption can explain some of the findings of this study. Respondents who believe to feel better after watching, show an increased watching time, regardless if they actually feel better or worse afterwards. One explanation of this could be that individuals strive to improve their current mood. Individuals are possibly less in contact with their own emotions and mood. Therefore, the exhaustion in itself might not be a predictor, but the desire to constantly improve mood is. Accordingly, individuals who assume to be in a better mood after watching VOD streaming content, are also more likely to show an increased amount of watching time, in an attempt to improve their mood. People without that expectation therefore may seek other ways of improvement.

Moreover, the linear mixed model indicated that happiness was linked to watching time and neglect of obligations. This link could not be supported with other conventional simple correlations methods. This can be due to a weak effect present or small sample size for the simple correlation analyses. Furthermore, linear mixed models tend to carry substantially more power, when the assumptions are met. This facilitates finding an effect in longitudinal data. The correlation analysis did provide an indication of direction on the individual level as well as over time and shows that obligation neglect might be negatively correlated to happiness. Accordingly, the less an individual perceives neglect of daily obligations, the happier he/she is and vice versa. This is in line with suggestions that individuals who perceive that obligations of their daily life are neglected are likely to experience feelings of guilt. These should have an impact on the feeling of well-being and happiness (Granow, Reinecke, & Ziegele, 2018).

For watching time and level of happiness, no indication of direction was found. Besides the underpowered simple correlation analysis, it may be the case that the positive and negative consequences of engaging in watching behaviour on happiness balance each other out. To be more precise, no effect could be found since some individuals experience watching as positive, for instance, while watching with others or being entertained (Pittman & Sheehan, 2015). Others might experience watching as negative, for instance in terms of procrastination or having the feeling of being not in control of the behaviour (Granow, Reinecke, & Ziegele, 2018). Accordingly, it might be attributable to personality traits, whether the consequences of watching VOD-streaming content are perceived positively or negatively. This relationship

should be further investigated by the incorporation of character traits, such as impulsivity (Riddle, Peebles, Davis, Xu, & Schroeder, 2018) or sensation seeking (Shim & Kim, 2017). Such traits might act as potential moderators when it comes to watching behaviour.

The research design included some limitations, which have to be taken into consideration. One limitation concerns a possibly small effect size in the sample. An effect can be small which makes it more difficult to grasp through conventional statistical procedures, even though it constitutes a crucial part of the model. This can be the case, for instance, in regard to the relationships between the level of happiness and watching time, as well as between neglect of obligations and happiness. This is especially true for the more conventional methods, carrying substantially less power, compared to the linear mixed models. These linear mixed models can take the nested and longitudinal structure of the dataset into consideration, which is likely to be the reason why an effect was found in these models but not in simple correlations and regression analyses. However, even though an effect could be detected in the linear mixed model, these effects seemed rather small. The power is likely to be too low with typical statistical procedures since only estimated marginal means can be taken into account. Accordingly, collecting more data from more individuals should facilitate the detection of an effect and thereby aid in precluding this limitation.

Another limitation which should be considered is that the study design may in itself act as an intervention. By indicating each day how much VOD-streaming content was consumed, individuals were made aware of their consumption behaviour. Accordingly, and due to the negative connotation of binge-watching, participants might have the feeling that it is necessary to reduce their watching behaviour in general. This is suggested as the participants were increasingly made aware of their time spent on Netflix and similar platforms. However, a study by Hufford, Shields, Shiffman, Paty, and Balabanis (2002) indicated that a reaction to an ESM study was generally only weak. The article also mentioned that further research is necessary.

The last limitation concerns the generalisability of the results due to a non-representative sample. 73% of the participants were aged between 21 and 23 and the sample consisted of 84.4% of students, indicating a young and well-educated sample. The sample seemed to be composed of individuals who seemed to be in control of their watching behaviour. Participants reported engaging in few and short VOD-streaming sessions. This might be due to the time point chosen for the study. Since many students are included in the sample, external events, such as exams, are likely to influence the watching behaviour in terms of less time spent watching. Thus, the sampling process is likely to include a selection

bias, which has to be taken into consideration. For future studies, either a more diverse sample or a sample of the at-risk population should be collected.

Besides the limitations, also strengths were observed in the research design. Especially the longitudinal nature of the data is an advantage of the research design. This data collection method allows for the collection of large amounts of data which, in turn, provides a more accurate, momentary and holistic representation of behaviours and feelings (van Berkel et al., 2017). Particularly regarding watching behaviour, longitudinal data can facilitate the recognition of individual patterns in watching behaviour.

In line with the longitudinal data collection, the usage of experience sampling is another strength of the research design. The ESM can generate more accurate data when encountering changes in patterns of mood/internal processes or watching behaviour over time (van Berkel et al., 2017). Moreover, cross-sectional designs are prone to include biases and errors, such as social desirability, confirmation bias or recollection error, which can distort the data (van Berkel et al., 2017; Lindell & Whitney, 2001). By using ESM, variables such as exhaustion and watching behaviour are assessed separately at different time points, which reduces bias and method effects.

A last advantage of the study design was that it was unobtrusive and easily useable. Participants could use the application in their daily life, without entering a laboratory setting. Hence, it was simple for individuals to take part in the study even when they are at home. The application took about 8 minutes time, which was spread over the day. Moreover, they were notified and reminded of the availability of a questionnaire. Accordingly, it could be easily integrated into daily life and ensured a high response rate. The application was easily usable for everyone, except for one technical difficulty, which was fixed one hour after its occurrence.

Further research should investigate the link between watching time and happiness as well as obligation neglect. Although links between watching time and happiness as well as a perceived neglect of obligations and happiness were indicated in the employed linear mixed model, this could not be confirmed using conventional statistical procedures. However, since linear mixed modelling can incorporate the nature of longitudinal data, they are considered to have substantially more power. This suggests that these links should not be underestimated, only because less powerful methods could not confirm the findings. In future studies, this link should be further explored to get a clear picture of the phenomenon of binge-watching or an increased watching time, its consequences or predictors. The level of happiness might act either as a predictor for an increased watching time, or as a consequence

of VOD streaming. Therefore, a recommendation is to collect more data in relation to these links. Further clarifications concerning the influence of watching time and obligation neglect on an individual's well-being or vice versa will prove valuable.

The association between the expectancy of outcome after watching and VOD-streaming time should be investigated further. Individuals who believe to feel better after streaming VOD-content are likely to engage more strongly in Netflix, Amazon Prime Video and other platforms. This link should be further investigated. It could be the case that individuals are constantly striving to improve own mood states regardless of their current mood. Therefore, people with the expectancy to feel better after watching are more prone to watch longer sessions than people who do not expect a mood change afterwards. In the long run, such information can be used to address and design specific interventions.

To get deeper insights into watching patterns and risk groups, analysis on an individual level can be beneficial. Identifying extreme patterns in the sample, for instance, in terms of individuals who watch VOD-streaming content extensively, can lead to new valuable insights. Accordingly, future research should not only focus on group level analyses but also be aware of individuals watching patterns, that give indications of certain risk groups and predictors at hand. Specifically, employing linear mixed models in such studies should prove beneficial, as these can facilitate such longitudinal analyses.

Since the data gathered regarding the watching time of VOD content still incorporates a retrospective component, future studies should try to further decrease the reliance on the memory of participants. This could be done by assessing every 5 to 6 hours whether the participant watched VOD-content. Participants could be notified to answer the questions on their smartphone. To decrease the inconvenience for the participants, the item should be formulated as clear as possible with the options to indicate "no" or "yes, I watched \_\_\_ minutes". Accordingly, a more accurate picture of watching patterns is achieved since researchers could identify for instance, how watching time is distributed throughout the day and how this could be linked to moods (e.g. exhaustion or happiness). Most importantly, the reliance on the memory is decreased, which should create even more precise data. However, it should be taken into account that using this method is more obtrusive.

To conclude, the results indicated that people who expect to be in a better mood after watching VOD-streaming content are likely to show an increased watching time. This result implies that such an outcome expectancy can be seen as a risk factor for increased streaming on VOD-platforms such as Netflix, which should be further explored. Moreover, if individuals perceive to not be in control of daily obligations, they tend to be less happy.

Accordingly, if an increased watching time leads to the neglect of daily obligation, negative consequences for the individual's well-being are likely to follow. Lastly, other predictors and consequences need more investigation, such as the link between watching time and happiness. Other, yet unexplored, more stable or situational predictors are likely to exist, which increase the need for further research in the field of binge-watching.

The consumption of VOD-streaming in quantities is a growing phenomenon that will not disappear in the near future. These findings highlight the current lack of knowledge and scientific engagement concerning this topic. To make sure that the benefits of this phenomenon can be enjoyed by the public to the maximum extent, further research and interventions can take this study as a steppingstone and build upon it.

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# Appendices

## Appendix 1.1

### *Welcome e-mail*

Hey there!

Thank you very much for agreeing to participate in our study about the “Antecedents and Consequences of Binge-watching”!!! This project will be conducted from the **29<sup>th</sup> of April until the 13<sup>rd</sup> of May** (2 weeks in total). In general, our goal is to explore the sparsely researched topic of binge-watching. The world of science is rather undecided on a clear definition of this phenomenon. Hence, we will provide you with our definitions down below to make sure we’re on the same page. Most importantly, **in order to participate in this study, it is necessary that you follow the steps in the “What You Need To Do” section.** We recommend you mark this Email as “important” in your inbox, so you can easily find it again.

### **What you need to do:**

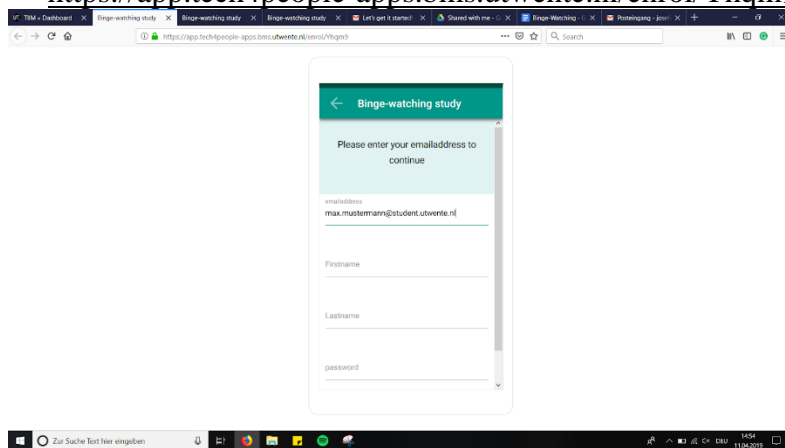
In the next 2 weeks you need to answer **three different questionnaires a day** at:

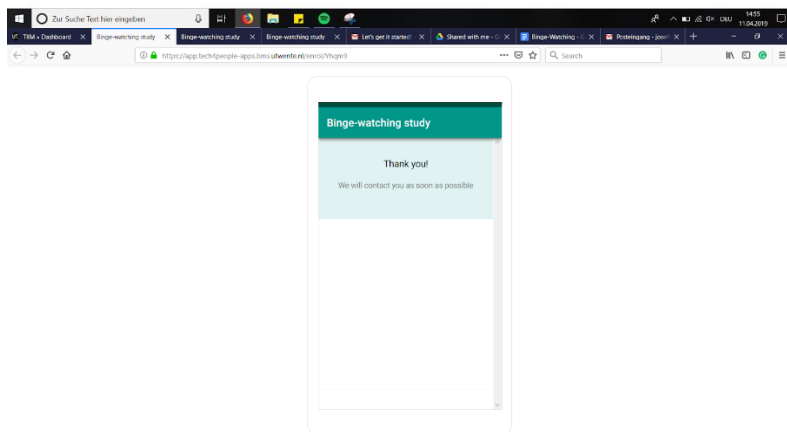
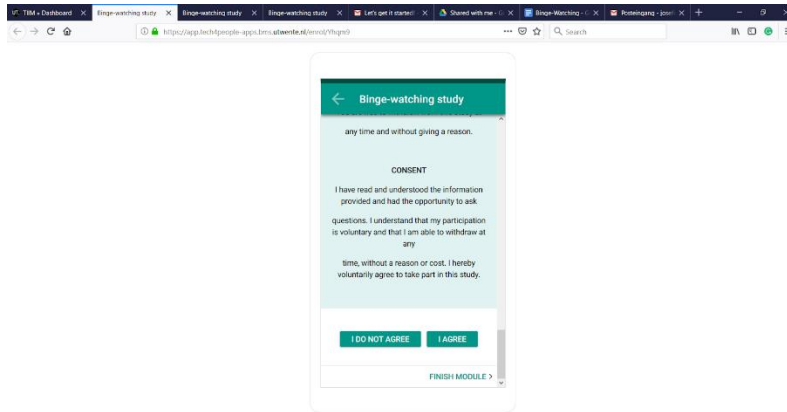
- **9:00 a.m.** (max. 5 minutes)
- **9:00 a.m.** (max. 2 minutes)
- **3:00 p.m.** (max. 2 minutes)
- **9:00 p.m.** (max. 2 minutes)

Conveniently enough, this will be done via the **TIIM app**. In order to participate in this study, you need to click on the link down below and download the TIIM app in the respective app store:

1. Click on the following link to enrol and register with your full name and address

→ <https://app.tech4people-apps.bms.utwente.nl/enrol/Yhqm9>





2. Download the TIIM app  
 → Google Play Store:  
<https://play.google.com/store/apps/details?id=nl.bmslab.utwente.tiimapp>  
 → iTunes App Store:  
<https://itunes.apple.com/de/app/tiim/id1229896853?l=en&mt=8>
3. Open the App
4. Log in with your Email address and your password
5. Make sure your notifications for this app are turned on

If you have done everything correctly, you should receive the first notification at 9:00 a.m. on the 29<sup>th</sup> of April. If you do not get any questionnaire around 9:00 a.m., please contact us instantly.

The questionnaires are going to take you max. 10 minutes in total each day.

Keep in mind that **we cannot reward you with any SONA credits if you fail to answer the questionnaires** regularly. We understand that you miss out one or two days in a row, since some days are very busy or you will not have internet all the time, but please try to set aside some minutes every day. We will send you notifications regularly to remind you of the questionnaires, but it is very important that you **check your phone around the times mentioned above**.

If you have any questions, comments, or doubts about the study feel free to contact us at [f.cordts@student.utwente.nl](mailto:f.cordts@student.utwente.nl). We will reply as soon as possible.

Best regards,

Hannah, Josefine, Laura, and Florian

## **Appendix 1.2**

### *Sign-up email*

Thank you for signing up!

You have been added to the list of participants.

Remember to turn the notifications on for the TIIM app and check your phone around 9:00 am, 3 p.m., and 9 p.m. for the next two weeks. Your effort is greatly appreciated!

Best regards,

Hannah, Josie, Laura, Florian

## **Appendix 1.3**

### *Study starts e-mail*

Heyo,

The study has started! If you have received a notification by the TIIM app, you have done everything correctly. In case you have not, please check again whether your notifications are turned on. Feel free to contact us anytime at [f.cordts@student.utwente.nl](mailto:f.cordts@student.utwente.nl) if you run into any problems or if you have questions about the study which haven't been answered by our initial Email.

We're looking forward to the next two weeks with you!

Best regards,

Hannah, Josie, Laura, Flo

## **Appendix 1.4**

### *Informed consent*

#### **INFORMED CONSENT**

Florian Cordts, Laura Seifert, Josefine Sundermann, Hannah Troles

Contact: [f.cordts@student.utwente.nl](mailto:f.cordts@student.utwente.nl), [h.troles@student.utwente.nl](mailto:h.troles@student.utwente.nl)

1st supervisor: Dr. P. M. ten Klooster

2nd supervisor: Dr. M. E. Pieterse

#### **Antecedents and consequences of binge-watching: an experience sampling study**

#### **PURPOSE OF STUDY**

Before you decide to participate in this study, it is important that you understand why the research is being conducted and what it will include. Please read the following information carefully. Please ask the researchers if there is anything that is not clear or if you need more information. The purpose of this study is to find out more about online television watching using video on demand streaming services. Due to the increasing popularity of for example Netflix, Amazon and Youtube, watching online series and movies becomes more frequent, especially among university students. Within this study we want to learn more about binge-watching behaviour with focusing on whether it is more intentional, whether there exist any gender differences, whether it has an impact on your mood states and well-being and finally whether it interferes with your daily life activities.

## STUDY PROCEDURES

If you participate in this study, you have to fill out one questionnaire concerning your demographics and four questionnaires including questions about your behaviour and mood related to your VOD watching behaviour, and questions concerning your mood and emotions in general.

For this, you will be asked to download the TIIM application on your mobile device. You will use this application for a period of two weeks to answer short daily questionnaires (approximately 3-5 minutes). For the purpose of this study, it is important that you answer the questionnaires in the given time frames. Make sure that you have switched on your notifications on your mobile device, as you will receive a notification on your mobile device about when to fill in the questions.

## CONFIDENTIALITY

The information that we collect from this research project will be kept confidential. This means that only the researchers have insight into your answers. All personal data (such as e-mail, age, gender etc.) will be anonymized and will not be published and/or given to a third party.

## CONTACT INFORMATION

If you have questions at any time about this study, you may contact the researchers.

## VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. You are free to withdraw from this study at any time and without giving a reason.

## CONSENT

I have read and understood the information provided and had the opportunity to ask questions. I understand that my participation is voluntary and that I am able to withdraw at any time, without a reason or cost. I hereby voluntarily agree to take part in this study.

## Appendix 2

*Baseline questionnaire “Who are you?”*

The image displays three sequential screenshots of a mobile application interface for a 'Binge-watching study' questionnaire. Each screen has a teal header with a back arrow and the text 'Binge-watching study'.  
The first screenshot shows a welcome message: 'Thank you for participating! Before we get started we would like to ask you some basic questions. If you have any questions feel free to contact us (f.cordts@student.utwente.nl)'. A teal button labeled 'LET'S GO!' is at the bottom.  
The second screenshot asks 'Please indicate your age.' and features a text input field with the placeholder 'type your answer here'. Navigation buttons '< PREVIOUS QUESTION' and 'NEXT QUESTION >' are at the bottom.  
The third screenshot asks 'Please indicate your gender:' and lists three radio button options: 'Male', 'Female', and 'Other'. Navigation buttons '< PREVIOUS QUESTION' and 'NEXT QUESTION >' are at the bottom.

**Binge-watching study**

Please indicate your nationality.

- Dutch
- German
- Other \_\_\_\_\_

< PREVIOUS QUESTION    NEXT QUESTION >

**Binge-watching study**

Please indicate your occupation.

- pupil
- student
- employed full time
- employed part-time
- unemployed
- Other \_\_\_\_\_

< PREVIOUS QUESTION    NEXT QUESTION >

**Binge-watching study**

Which video-streaming-platform(s) do you use on a weekly basis?

- Netflix
- YouTube
- Amazon Prime
- Hulu
- HBOGo/HBOnow
- Other

< PREVIOUS QUESTION    NEXT QUESTION >

**Binge-watching study**

Generally, I am in a better mood after binge-watching.

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

< PREVIOUS QUESTION    NEXT QUESTION >

**Binge-watching study**

Make sure to check your phone every now and then!

And please turn on your notifications for this app

**YES, I PROMISE**

< PREVIOUS QUESTION

## Appendix 3

### Retrospective questionnaire “Questions about yesterday”

**Screen 1:** Introduction screen with a cartoon of a dog watching TV. Text: "All of the following questions are related to your behaviour/feelings from YESTERDAY!!! Please answer them carefully, it will take about 5 minutes." Button: "OK".

**Screen 2:** Question: "Did you watch video streaming content? (Netflix, Youtube, Amazon Prime, Sky, ...)" Options:  yes,  no. Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

**Screen 3:** Question: "How many episodes did you watch?" Option: "- select an option -". Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

**Screen 4:** Question: "How many minutes did you watch?" Option: "- select an option -". Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

**Screen 5:** Question: "What type of content did you watch?" Options:  comedy,  drama,  romance,  action,  thriller,  documentary,  tutorial,  nothing.

**Screen 6:** Question: "What was the reason for watching? (multiple options possible)" Options:  Entertainment,  Boredom/Nothing else to do,  Relaxation/Taking a break,  Interest/Curiosity,  Distraction/Escape from reality,  Procrastination/Avoidance of other tasks,  Information seeking.

**Screen 7:** Question: "In what context did you watch?" Options:  alone,  with friends,  with partner,  with family,  I did not watch. Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

**Screen 8:** Question: "How much time did you spend on Netflix/Amazon Prime?" Text: "It's only an estimation, choose the answer you deem to be closest to the actual time" Option: "- select an option -". Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

**Screen 9:** Question: "How much of that was intended?" Text: "Intentional watching is when you plan ahead of time to watch a show (not as background noise, but as primary focus of attention)" Option: "- select an option -". Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

**Screen 10:** Question: "How much time did you spend on YouTube?" Text: "It's only an estimation, choose the answer you deem to be closest to the actual time" Option: "- select an option -". Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

**Screen 11:** Question: "How much of that was intended?" Text: "Intentional watching is when you plan ahead of time to watch a show (not as background noise, but as primary focus of attention)" Option: "- select an option -". Buttons: "< PREVIOUS QUESTION", "NEXT QUESTION >".

< Binge-watching study

I spent less time than planned on household activities

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

I spent less time than planned on physical exercises

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

I spent less time than planned on academic activities

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

I spent less time than planned on social activities

- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

To what degree did you neglect responsibilities/obligations of your daily life?

not at all                      very much

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

To what extent did you feel guilty after watching video streaming content?  
(If you did not watch anything, move the number slider to 'not at all')

not at all                      very much

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

To what extent did you feel happy after watching video streaming content?  
(If you did not watch anything, move the number slider to 'not at all')

not at all                      very much

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

To what extent did you feel relaxed after watching video streaming content?  
(If you did not watch anything, move the number slider to 'not at all')

not at all                      very much

< PREVIOUS QUESTION    NEXT QUESTION >

< Binge-watching study

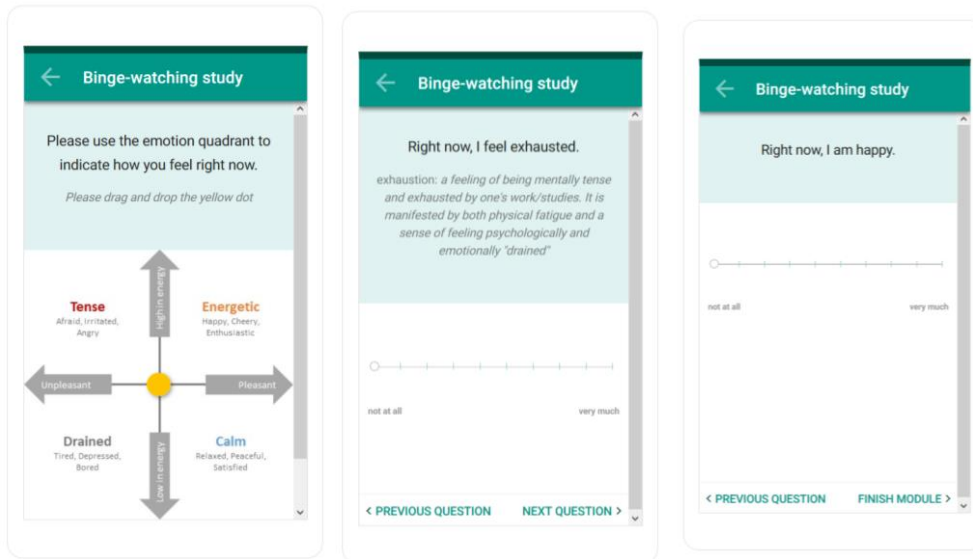
That's it for now!

< PREVIOUS QUESTION



## Appendix 4

Momentary measurement “How do you feel?”



## Appendix 5

Emotion quadrant

