

# **Binge-watching and its influence on psychological well-being and important daily life duties**

An Experience Sampling Study

**Bachelor Thesis**

Hannah Troles

**University of Twente**

Health Psychology and Technology

**First supervisor:** Dr. M. E. Pieterse

**Second supervisor:** Dr. P. M. ten Klooster

## Abstract

**Background.** The use of video-on-demand streaming services rapidly increased especially among younger individuals, resulting in the novel phenomenon ‘binge-watching, i.e. watching multiple episodes in one sitting. Some studies discovered that binge-watching has adverse effects on well-being, while other studies in contrast demonstrated that it enhances one’s mood. Nevertheless, research into the phenomenon is still limited. The present study used experience sampling (ESM) as the research method to investigate binge-watching in individuals’ natural environment.

**Aim.** The study used ESM to gain a deeper insight into binge-watching behaviour, in terms of immediately generated psychological consequences and its impact on important daily life duties.

**Method.** By using a mobile application, 45 participants including mainly students were required to complete daily questionnaires regarding their watching behaviour, daily life activities and feelings after watching over the course of 15 days. The obtained data was analysed using linear mixed model (LMM) analyses and simple bivariate correlation analyses with the estimated means.

**Results.** The participants watched video streaming content on a regular basis with a daily mean of 89.48 minutes and an average of 2 episodes in a row with 44 % of the 15 days displaying binge-patterns. A remarkably diverse pattern of watching time between participants was found, with one participant watching up to 6 hours a day. The LMMs analyses indicated that both daily life activities and psychological consequences were associated with watching video streaming content. Furthermore, significantly strong positive correlations were found between watching video streaming content and feeling more happy and relaxed afterwards. However, no significant correlations between negative psychological consequences and watching video streaming content were demonstrated. In addition, simple bivariate correlation analysis could not provide information on the nature of the association between watching time and the neglect of daily life activities.

**Conclusions.** Predominantly positive effects were found, namely that participants tend to feel more happy and relaxed after watching. However, the study did not find evidence that watching video streaming content leads to adverse health effects or an extreme neglect of daily life duties. Overall, for the sample as a whole, watching video streaming content seems to build a normal part of entertainment and leisure time activities. Nevertheless, simple bivariate Post-Hoc correlation analyses were very crude and extremely underpowered for the sample. Moreover, the items measuring the neglect of the four daily life activities need to be considered with caution. Further research into binge-watching behaviour is essential. It is recommended to continue research using ESM to gain deeper insight into behavioural patterns of binge-watching and its negative influences on daily living.

**Key words:** binge-watching behaviour, experience sampling method(ESM), daily life activities, psychological consequences

## Introduction

In the past couple of years, television audience viewership went through a variety of developments. More and more people are likely to shift from broadcast or cable TV to watching TV shows via video-on-demand streaming services such as Netflix or Amazon Prime Video. For instance, in 2014 a significant decline of watching traditional TV has been reported which was more abrupt than in any other previous year (Luckerson, 2014). Thus, streaming services like Netflix are causing the steady decline of linear television. In the US, 40% of households subscribed to streaming services in 2014 and the selection of Netflix-produced shows has been expanding since the streaming of the first company's original show 'House of cards' (Louise, 2016). Video-on-demand- streaming services are able to offer complete autonomy for the viewer, as one can watch for instance an entire season, without waiting as traditionally, for the next episode each week. Consequently, making movies and especially TV shows easily accessible for the consumer may lead to an excessive use of these video-on-demand services including the rise of so called 'binge-watching'. Viewers across the world increasingly engage in binge-watching. Almost 30 million subscribed to Netflix, making it one of the leading providers of streaming media. In fact, Netflix is not only aware of the rapid increase of binge watching, but seems also to be facilitating the phenomenon as a viable consumptive activity (Pitmann & Sheehan, 2015).

As binge-watching is a novel rising phenomenon and research is still at the beginning, it also remains difficult to conceptualize it (Rubenking, Bracken, Sandoval, & Rister, 2018). Most determine binge-watching as watching multiple episodes of a series in one sitting, with some specifying it as watching at least two or more episodes of the same show in one single sitting (Flayelle et al., 2019; Pitmann & Sheehan, 2015; Walton-Pattison, Dombrowski, & Pesseau, 2016). However, several scientific articles criticize the term binge-watching and see it as unspecific (Perks, 2014; Pittman & Sheehan, 2015). In compliance with that, is that the term 'binge' is automatically related as something negative, since binging is seen as an extreme unhealthy behaviour such as binge eating or binge drinking. Therefore, some scholars refer to the term 'marathon-viewing' to avoid the negative connotation (Perks, 2014; Pittman & Sheehan, 2015). Nevertheless, recent studies showed that the intensive consumption of on demand streaming content can affect users' well being negatively, especially in terms of addiction, thus arguing in favour of the term 'binge'-watching. In particular, the study by Sung, Kang and Wee (2015) demonstrated that viewers who often engage in binge-watching, displayed symptoms of addiction, including higher levels of loneliness, depression, and reduced self-control. The addictive potential of television binge-watching was also found to be related to unintentional and intentional binge-watching, suggesting that those who binge-watch unintentionally are more likely to get addicted than those who plan to

watch in advance (Riddle, Peebles, Davis, Xu, & Schroeder, 2018). Similarly, the survey by Devasagayam (2014) discovered that among 20 respondents 60% felt addicted to the show they watched and 75% felt that the streaming platform, in this case Netflix, clearly encouraged them to watch more. The respondents indicated that they were so interested and could not resist, but watch more and let the platform play another episode.

Given the fact that binge-watching may result in an addictive or compulsory behaviour, it possibly interferes with daily life activities, thus generating conflicts and personal and social tensions. As recent studies showed that video on-demand services are especially used by younger individuals under the age of 25 and that binge-watching is a very common phenomenon among university students (Chastin, DeCraemer, Oppert, & Cardon, 2017; Riddle et. al., 2018), their daily life might particularly involve academic activities. A recent study by Mohr (2017) demonstrated that students are at risk to get drawn into or lost on the Internet through binge-watching. Similarly, the survey by Winland (2015) revealed that watching online content is distracting students from academic activities. In particular, 74 participants were included in the survey, from which 87% spent three hours or more watching online content in one sitting. 59.7 % of those agreed that watching online content is distracting from academic activities, and 39.4% reported to be less engaged in their academics than with watching online content. However, the study could not demonstrate a correlation between binge-watching and academic engagement and is lacking statistical significance. Thus, the study provides a foundation for further research and discussion on the online streaming behaviour of students (Winland, 2015). Comparably, Flayelle, Maurage, and Billieux (2017) demonstrated that the direct negative influence of binge-watching on daily activities of students remains uncertain. The study revealed that six out of seven participants did not identify binge-watching as having a major negative outcome for daily living. Yet still, one participant reported negative consequences of binge-watching, such as missing classes or reduced social activities, such as spending time with friends. Adjacent to the interference of binge-watching with academic activities, binge-watching might also displace other activities such as household, sleeping and personal upkeep (Riddell et al. 2018). However, it remains unclear and research is lacking in terms of whether binge-watching interferes with daily life obligations such as household, social activities or physical exercises.

Furthermore, prior research into the field of media entertainment demonstrated that media consumption at the cost of other goals or responsibilities often results in guilt – a negative self-evaluation caused by conflicts between a current behaviour (e.g., media use) and the personal goals and responsibilities of the individual. In turn, guilt can decrease situational well-being shortly after the period of intensive media use (Reinecke, Hartmann, & Eden, 2014). Consistently, a more recent

study by Granow, Reinecke, and Ziegele (2018) discovered that binge-watching increases the risk of goal conflicts between entertainment consumption and other obligations initiating feelings of guilt and reducing the potential positive effects of entertaining media use on well-being.

Experiencing negative feelings such as guilt after a binge-watching session can be regarded as a symptom of low mental well-being. But it can also be considered as a positive signal: the subject learns that this behaviour gives unwanted consequences, which might motivate to regulate this behaviour. So, this might protect against future (risky) binge-watching.

Since binge-watching might have harmful effects on the users, it is essential to explore what benefits people perceive by indulging in such behaviour. Different theories have been applied trying to explain people's motives for that specific behaviour. The *uses and gratifications theory*, introduced by Katz, Blumler and Gurevitch (1973), emphasizes the viewer's motivations of consumption and understands the audience as active participants in the media selection process. The theory supposes that viewers are aware of their desires and needs, and are able to act on them. Katz et al. (1973), determined five gratifications of media consumption: entertainment, information, escapism, social interaction and identification. Consistently, current research has proposed various factors that motivate people to binge-watch, such as engagement, relaxation, entertainment, passing time, and escape from reality (Pitmann & Sheehan, 2015). A subsequent online survey of 785 binge watchers identified enjoyment, efficiency, recommendation of others, perceived control, and fandom as the key motives for binge-watching. In particular, individuals perceived binge-watching as means to satisfy their desires for enjoyment, efficiency, and control (Shim & Kim, 2018).

Complementary to the uses and gratifications theory, Zillmann and Bryant (1985) proposed the *mood management theory*. Mood plays a key role in the selection of media content. The theory predicates that consumers select media content in order to enhance their mood. They choose relaxing or exciting content based on their level of arousal and try to prolong or lift their mood depending on their current mood state. Consumers also avoid specific television content that reminds them for instance of stressful situations (Zillmann & Bryant, 1985). In concordance, Rubenking et al. (2018) found in their recent study that people engage in binge-watching to manage their moods and to relax. It is seen as a reward after a long working day and specifically as a mean to repair a mood. In addition, binge-watching is related to social needs, encompassing to discuss the content and binge watch with friends or family (Rubenking et al., 2018). This social component has also been investigated by another study, in which participants indicated that TV series offer a topic for discussion, enabling to keep up with others, sharing impressions and reactions. It appears to be not only a solitary activity, but an opportunity to spend pleasurable time with the partner (Flayelle et. al., 2017).

It becomes clear that binge-watching as a new type of consuming media content is associated with negative and positive outcomes for the user. Clearly, video on demand streaming services such as Netflix make it difficult for the user to stop watching, hence promoting the potential risk of addiction. On the other hand on-demand media consumption fulfils the users' need for entertainment and enjoyment and is used as a mean to repair mood or relax. Regardless, binge-watching as a new pattern of consuming TV shows, remains a novel rising phenomenon, thus still limited in its research, lacking insights into the effects on users' mental well-being. It is still unclear if binge-watching comprise an unhealthy behaviour in terms of negative psychological consequences and whether it interferes with daily life activities and obligations. Furthermore, although previous mentioned research addressed the novel phenomenon of binge-watching, most of them used a cross-sectional survey design or small qualitative focused groups, which do not permit causal inferences (Flayelle, Maurage, Vögele, Karila, & Billieux, 2018; Granow et. al., 2018). Therefore, this study uses an experience sampling method (ESM) to investigate the experience of the participants in their natural environment over time. ESM increases ecological validity, meaning that the findings are more representative for the participant's daily lives (Larson & Csikszentmihalyi, 2014). By using ESM it is possible to include systematic self-reports of participants' activities, experience and feelings and measure their behaviour at multiple occasions in real life and real time. Through the use of ESM it is possible to generate an intensive longitudinal measurement, whereby participants are asked to repeatedly answer short questionnaires during the day over a period of two weeks. Moreover, ESM can prevent global and recall biases, since it leaves not much time between the stimuli and the response, as it is a measurement of real-life events and allows causal interference (Scollon, Kim-Prieto, & Scollon, 2003).

Based on the above discussed research studies, two research questions are derived. First, due to the lack of evidence that binge-watching is a hazardous behaviour with negative mental health outcomes, the first research question is formulated as follows:

*To what extent is binge-watching associated with the immediate occurrence of negative psychological consequences?*

Second, as it still remains unclear to what extend binge-watching interferes with users' daily life activities and obligations, the second research question is stated as follows:

*To what extent is binge-watching associated with a direct impact on important daily life duties, including physical exercise, academic, social and household activities?*

## Methods

### Design

For this study, an experience sampling method (ESM) was employed enabling a longitudinal intensive measurement with a smartphone app, called The Incredible Intervention Machine (TIIM) designed by the BMS lab of the University of Twente ("TIIM (The Incredible Intervention Machine)," 2018).

### Participants

To be included for participation in the study, the participants needed to own a mobile device, either smartphone or tablet with Android or IOS and required a subscription to a video on demand platform. Moreover, sufficient English language proficiency was required in order to complete the English questionnaires. The study involved 45 participants (64.4% female, 35.6% male), aged between 17 and 30, with a mean age of 22.7 ( $SD= 2.34$ ). The participants had different nationalities, including German, Dutch and others (91.1% German, 2.2% Dutch, 4.4% Other). The participants were either recruited using convenience sampling or via the SONA platform, where students of Psychology or Communication studies can assign themselves to the study. The participation was voluntary, but facilitated by providing incentive in form of SONA-credits. SONA-credits are mandatory to obtain for students studying Psychology or Communication Science throughout their Bachelor's program at the University of Twente. Every participant agreed to an active online consent provided via the TIIM application, prior to the participation, to fulfil the guidelines of the Ethics Committee of the University of Twente.

### Procedure

On the 10<sup>th</sup> of April the study was approved by the Ethical Committee of the Faculty of Behavioural Sciences of the University of Twente. Afterwards, the data collection started by first recruiting a sufficient number of participants. Each participants first received an informative email (Appendix A), including a detailed description of the longitudinal study and the use of the TIIM application. Participants recruited from SONA were additionally given a brief abstract of the study on the SONA-platform. The email included two links the participants had to follow. First, they needed to register themselves for the study and agree to an online informed consent enabling the researcher to assign each participant to the study via the TIIM app (Appendix B). Secondly, they



had to download the TIIM app on their mobile device in order to complete the daily questionnaires. Throughout the study the participants were given the opportunity to contact the researchers, in case any problems or questions arose. Moreover, the participants were able to withdraw from the study at any time, without giving a reason.

The researchers intended to investigate, in real life and real time, students' video on demand watching behaviour in relation to gender, well-being, psychological consequences, daily life obligations, and intentionality. Therefore, the participants were assigned four questionnaires each day for a period of 15 days. This particular period of time was used, since it is the most commonly chosen study length for ESM studies and usually results in a good response rate (Berkel, Ferreira, & Kostakos, 2017; Scollon, Kim-Prieto, & Diener, 2003). A baseline questionnaire was added on day one, which was designed to collect participants demographics. Three of the four daily questionnaires assessed the participants' momentary mood, while one of them was designed to measure the participants behaviour and feelings retrospectively of the last 24 hours. The mood questionnaires were available at 9a.m., 3p.m., and 9 p.m. and disappeared after six hours. The retrospective questionnaire was published at 9a.m. and disappeared 15 hours later. If the participants did not complete the questionnaire within the given time frame, they received a reminder two hours later to fill in their answers. Furthermore, the researchers monitored the response rates and contacted individual participants who did not respond regularly via Email and TIIM notifications. In total, to complete the baseline questionnaire, the participants took around two minutes. To complete the retrospective questionnaire the participants took around five minutes, and each momentary mood questionnaire took around one minute to complete.

Although some answers deviated from the given time point, most questions were completed each day and were all included within the analysis. After the data collection was finished, participants recruited via the SONA platform received the promised SONA credits. All participants received a final notification via the TIIM application, in which the researchers informed the participants about the end of the study and appreciated their participation (Appendix C).

## **Materials**

The study is part of a joint research project of four individual bachelor theses. Within this study only the baseline questionnaire and the retrospective questionnaire were used. In particular, 10 items were used from the retrospective questionnaire in order to investigate whether watching video streaming content is associated with the experience of negative psychological consequences and whether it relates to a perceived impact on daily life duties. The questionnaire assessing participants' momentary mood were not used in this study.

### ***TIIM (The Incredible Intervention Machine) application***

The present study made use of the TIIM (The Incredible Intervention Machine) application, which is an advanced intervention tool for collecting survey with biometric data capture developed by the BMS Lab of the University of Twente ("TIIM (The Incredible Intervention Machine)," 2018). The application is created for IOS and Android and is used to perform interventions on a group of participants. Sets of questions are sent to the participants on predefined fixed dates and times. The participants are notified on their mobile device when they receive these questions. The participants have a certain amount of time to complete the questions before they expire. As a researcher it is possible to create interventions in TIIM. These interventions include different modules which constitute of the desired sets of questions needed for the study. Each module received a fixed date and time to appear on the participants' mobile device.

### ***Baseline Questionnaire***

The baseline questionnaire contained 6 items. First, participants were asked to indicate their age using a number input. Secondly, they were required to indicate their gender. They had three options to chose from: 'male', 'female' and 'other'. Moreover, participants were asked to specify their occupation. They were allowed to select multiple options including 'pupil', 'student', 'employed full-time', 'employed part-time' and 'unemployed'. The 5<sup>th</sup> item asked: 'Which video-streaming platform(s) do you use on a weekly basis?'. Participants were again able to select multiple options including 'Netflix', 'Youtube', 'Amazone Prime', 'Hulu', 'HBOgo/HBOnow' as well as fill in other platforms manually, which were not listed in the options provided. The final item assessed their general mood state after watching video streaming content. It was self-constructed and formulated as 'Generally, I'm in a better mood after binge-watching'. The item had to be answered by selecting 'agree', 'neither agree nor disagree' or 'disagree'.

### ***Daily Retrospective Measurement***

The retrospective measurement contained 18 items, (14 questions, 4 statements) developed by the researchers, to assess participants' behaviour and feelings retrospectively of the last 24 hours. The measurement was taken daily for the two weeks of research. In particular, 10 items were essentially important for this research study. The first item 'Did you watch video streaming content?' was used to investigate whether participants watched video streaming content in the last 24 hours and could be answered with either yes or no. The second and third item were used to

assess how much time participants spent watching. Specifically, the second item focused on the number of episodes the participants watched, by asking: ‘How many episodes did you watch?’ The item needed to be answered using a drop down menu, with answer options ranging from ‘less than 1 episode’ to ‘more than 7 episodes’. When participants did not watch any episode or did not watch any video streaming content at all, they were also able to choose the answer options: ‘I watched a movie(s)’ or ‘I did not watch anything’. The third item focused on the amount of time participants spent watching, by asking: ‘How many minutes did you watch?’. Similarly, the item needed to be answered using a drop down menu, with answer options ranging from ‘1-30 minutes’ to ‘7 hours’. If participants did not watch any video streaming content, they were able to select the answer option ‘I did not watch anything’.

The items measuring number of watched episodes and the amount of watched minutes needed to be recoded into numerical data. The variable ‘How many minutes did you watch?’ was recoded into minutes, thus 1 hour has the value 60 in the model. ‘I did not watch anything’ was recoded into the value 0. The number of episodes watched were also recoded into numerics, hence ‘1 episode’ was recoded as 1, ‘less than 1 episode’ was recoded into the value 0.5 and ‘more than 7 episodes’ was recoded as 7.5. The answer option ‘I did not watch anything’ was recoded into the value 0 and ‘I watched a movie(s)’ was excluded from the analysis.

In order to assess participants’ perceived impact on daily life duties as a result of watching video streaming content, four statements were formulated as follows: ‘I spent less time than planned on household activities.’, ‘I spent less time than planned on physical exercise.’, ‘I spent less time than planned on social activities.’ and lastly ‘I spent less time than planned on academic activities.’ These items needed to be answered on a 5- point Likert scale ranging from strongly agree to strongly disagree. To enable analysis of the data, the items were recoded into the values 1 to 5 (strongly disagree=1, disagree=2, neither agree nor disagree=3, agree=4, strongly agree=5). The higher the selected value, the less time than planned has been spent on the activity and therefore has been more neglected. In particular, these four daily life activities were chosen, as mostly younger individuals engage in watching video streaming content and are suggested to be confronted with those activities on a daily basis. Moreover, *academic* activities were chosen instead of *occupational* activities as the sample mainly included students.

Furthermore, to assess participants’ possible psychological consequences in relation to watching video streaming content, three items were formulated regarding their mood state. The first item ‘To what extent did you feel guilty after watching video streaming content?’ was derived from the PANAS-SF (Positive and Negative Affect Schedule-Short Form) and is used to assess negative affect, which can be summarized as feelings of emotional distress (Watson, Clark & Tellegen,

1988). If participants would state to feel more guilty after watching video streaming content, it may indicate experiencing negative psychological consequences due to watching video streaming content. The following two items were self-constructed and asked participants ‘To what extent did you feel happy after watching video streaming content?’ and ‘To what extent did you feel relaxed after watching video streaming content?’. The aim was to measure as adequately as possible how people tend to feel immediately after they have watched video streaming content. Hence, the items were formulated using the attribution ‘*after watching video streaming content*’. However, the measurement was designed in a retrospective manner as it proved to be the most manageable option for this study. Therefore, the participants were requested to refer back to how they felt after they watched video streaming content the day before. The items had to be answered using a number slider ranging from 1 (not at all) to 10 (very much). Indicating a high number on the items would mean to feel more guilty, happy and relaxed. Selecting a lower number on the items would indicate to feel less happy, less relaxed and less guilty. Feeling more guilty, less relaxed and less happy is regarded as a negative psychological consequence. In case participants did not watch anything, thus were unable to answer the item adequately, they were instructed to move the number slider to ‘not at all’. For analysing the data, the participants who did not watch anything were excluded from the analysis. The retrospective questionnaire including the above described items can be found in the Appendix (Appendix D).

## **Data Analysis**

For the data analysis, the statistical program for social sciences (SPSS, version 24) was used. First of all, the data from the TIIM application was transformed into SPSS. Erroneous data, such as text input for numerical variables were recoded. The answers obtained on the baseline questionnaire, specifically participants demographics, preference of streaming platform and participants general mood state after watching video streaming content were analysed through descriptive statistics. Also the second and third item of the retrospective measurement, assessing how much time the participants spent watching, were analysed through descriptive statistics. Participants who did not complete the questionnaires for at least 3 days, were excluded from the data analysis.

A series of Linear Mixed Models (LMMs) with a first-order autoregressive covariance structure was used to analyse the hierarchical and nested structure of the repeated measurements. Linear Mixed Models deal with missing data and enable to estimate marginal means. For each LMM the time point (the 15 days) was set as the repeated measurement and the participants’ ID was set as the subjects. In each LMM, ID and Time point were also set as fixed factors to obtain

estimated marginal means for each participant over the two weeks and estimated marginal means for each day, aggregated for the total sample. In order to analyse whether watching video streaming content is associated with a perceived impact on daily life activities, the time spent on watching video streaming content was used as the dependent variable in the LMM. The variables measuring the perceived neglect of the four different daily life activities, namely household, academic, social activities and physical exercise, were each set as the covariate in four separate LMMs. Similarly, three separate LMMs were used for the psychological consequences, with feelings of guilt, happiness and relaxation being each set as the covariate.

To further explore the nature of the association between watching time and the four daily life activities as well as the association between watching time and experience of negative psychological consequences, a Post-Hoc test in terms of a simple bivariate correlation analysis was used. In particular, two types of Pearson's correlation analyses were performed. First, a Pearson's correlation was performed using the estimated marginal means of the sample on each of the 15 days (N=15), thus the between-subject differences are ignored. This Pearson's correlation is labelled as Pearson's correlation *per time point*. Secondly, a Pearson's correlation was performed using the estimated marginal means of each of the 45 participant over the two weeks (N=45). This Pearson's correlation is labelled as Pearson's correlation *per participant*. Within this Pearson's correlation, the change over time is taken out of the analysis, since each of the 45 participants has one mean over the 15 days, thus the time-dependency is ignored.

Hence, the estimated marginal means of the watching time in minutes and the estimated marginal means of each of the daily life activities were correlated *per time point* and *per participant* in two separate Pearson's correlation analyses. Similarly, the three variables assessing feelings of guilt, happiness and relaxation were correlated, but only *per participant*, due to means of relevance. The effect size was interpreted using Cohen's conventions (1988). A correlation coefficient of .10 is considered as a weak correlation, a coefficient of .30 as a moderate and a coefficient of .50 as a strong correlation.

## Results

45 participants completed the daily questionnaires via the TIIM application on a regular basis. One participant who did not complete the questionnaire for at least 3 days was excluded from the data set. On average participants responded on 10.95 (73%) of the 15 days requested. More females (64.4%) than males (35.6%) participated in the study. The majority (91.1%) were German and most of the respondents were students (75.6%). 39 participants (86.7%) stated to use Netflix on a weekly basis, followed by Youtube used by 32 participants (71.2%) and 16 participants (35.5 %)

use Amazon Prime. Table 1. illustrates the demographics and weekly used platform(s) of the participants. Furthermore, 26.7% of the participants agreed that they are generally in a better mood after binge-watching, 17.8% disagreed, and 55.6% were indecisive

Table1

*Descriptive Statistics of Baseline Questionnaire*

Variable		Frequency	Percentage
Age	Minimum	17	
	Maximum	30	
	Mean	22.7	
	Standard deviation	2.34	
Gender	Male	16	35.6%
	Female	29	64.4 %
Nationality	German	41	91.1%
	Dutch	1	2.2%
	Other	2	4.4%
Occupation	Employed full-time	5	11.1%
	Employed part-time	1	2.2%
	Pupil	2	4.4%
	Student	34	75.6%
	Student and working	3	6.7%
Platform(s)	Netflix	39	86.7%
	Youtube	32	71.2%
	Amazon Prime	16	35.5 %
	Kinox	1	1%
	Sky go/Sky q	1	1%
	Vivo	1	1%
	ARTE and so on	1	1%

**Watching behaviour over the two weeks**

During the study period, an average of 72.4% watched video streaming content daily, while an average of 27.6% did not watch video streaming content daily. The participants watched a daily mean of 89.48 minutes ( $SD=87.31$ ) and a daily mean of 2.02 episodes ( $SD= 2.07$ ) in a row. Thus, the mean of 2.02 episodes implies that participants watched a daily average of 2 episodes in a row,

during the 15 days. A very diverse daily estimated mean of watching time between the 45 participants over the two weeks was observed (Figure 1). For instance, participant 30 watched very little of video streaming content ( $M=8.46$  minutes,  $SD=20.87$ ), whereas participant 31 watched on two days up to 6 hours of video streaming content. Participant 31 watched a daily average of about 220 minutes ( $M=223.52$ ,  $SD=20.22$ ) during the study period which is more than 3.5 hours.

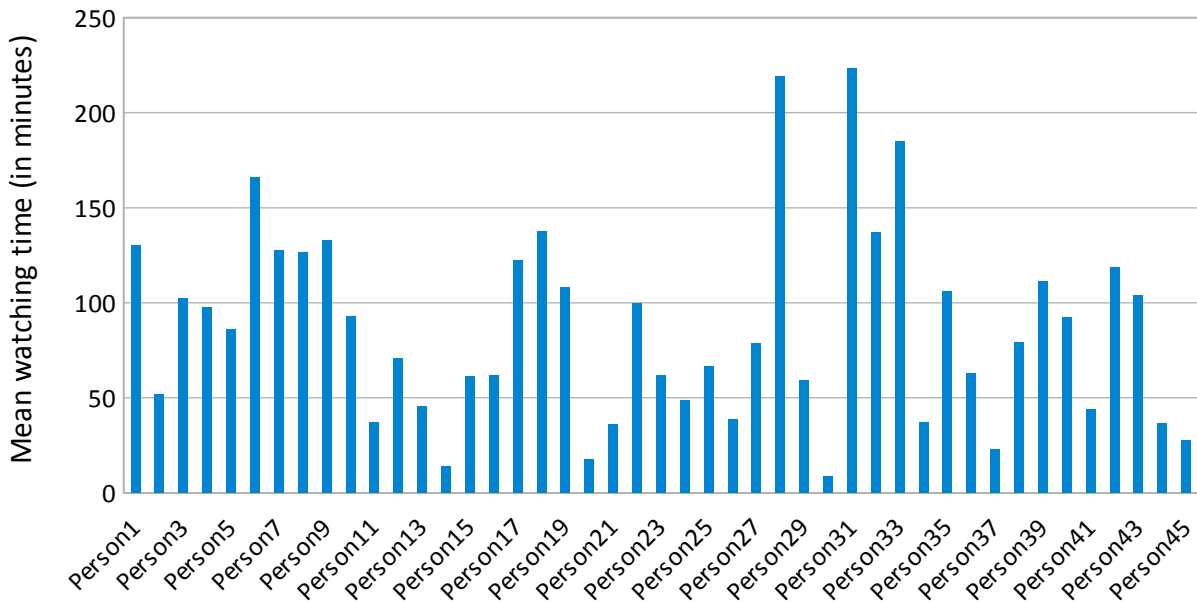


Figure 1. Mean of daily watching time of each participant over the two weeks

In contrast, the daily estimated mean watching time of the sample on each of the 15 days was quite stable, with a minimum of 65.82 minutes (Day 14) and a maximum of 103.41 minutes (Day 10) (Figure 2).

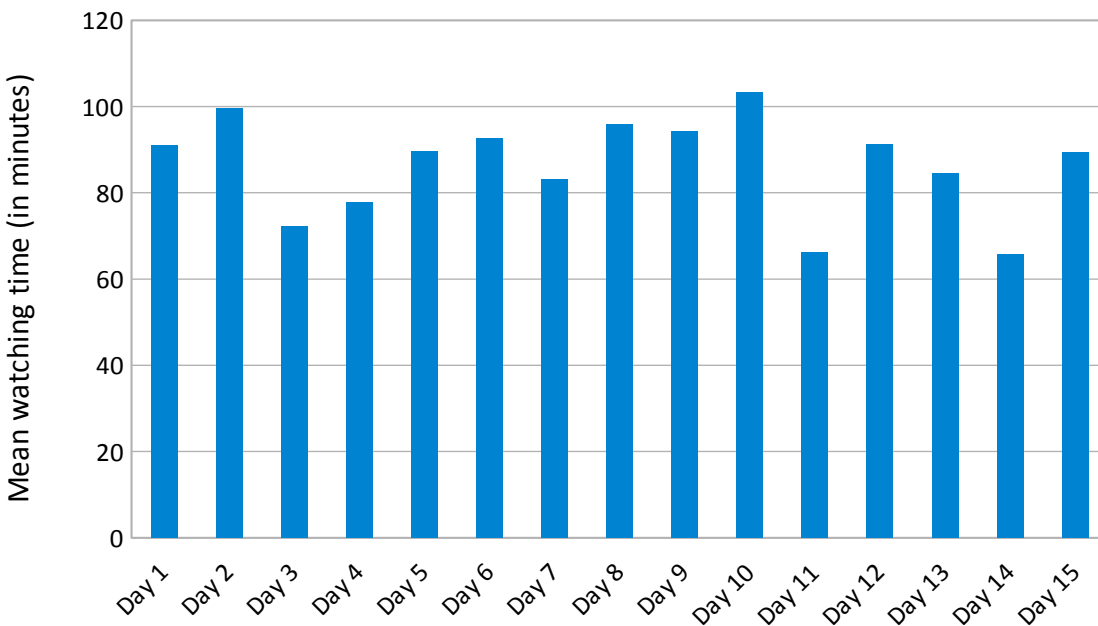


Figure 2. Mean of daily watching time of the sample on each of the 15 days

The daily mean watching time of the sample did not vary remarkably when comparing week one and two. On average the sample watched daily 1.44 hours in week one ( $M=86.65$  minutes,  $SD=9.42$ ) and 1.43 hours in week two ( $M=85.92$  minutes,  $SD=14.70$ ). When comparing the two measured weeks, it can be observed that merely on Tuesday (7<sup>th</sup> of May) the daily mean watching time of week one ( $M=72.24$ ) is noticeably lower than in week two ( $M=103.41$ ). However, the two measured weeks did not show any remarkable peaks on specific week days, but showed a very stable pattern of the daily mean watching time when regarding the sample at the group level – ignoring between-subject differences (Figure 3).

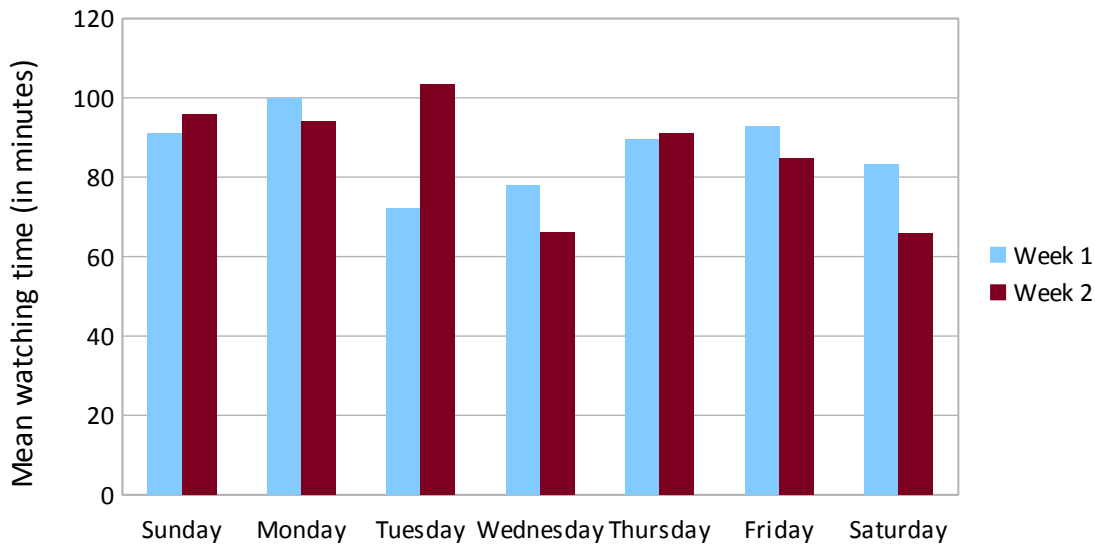


Figure 3. Comparison of mean watching time per week day. Daily mean watching time of week one in blue, daily mean watching time of week two in red.

Similar to the diverse daily mean watching time of each participant over the 15 days, the daily mean number of watched episodes during the two weeks varied strongly between the 45 participants. Again, participant 31 watched the most episodes during the two weeks, with a daily mean number of 6.08 episodes. Participant 30 merely watched a daily mean number of 0.12 episodes during the study period (Figure 4).



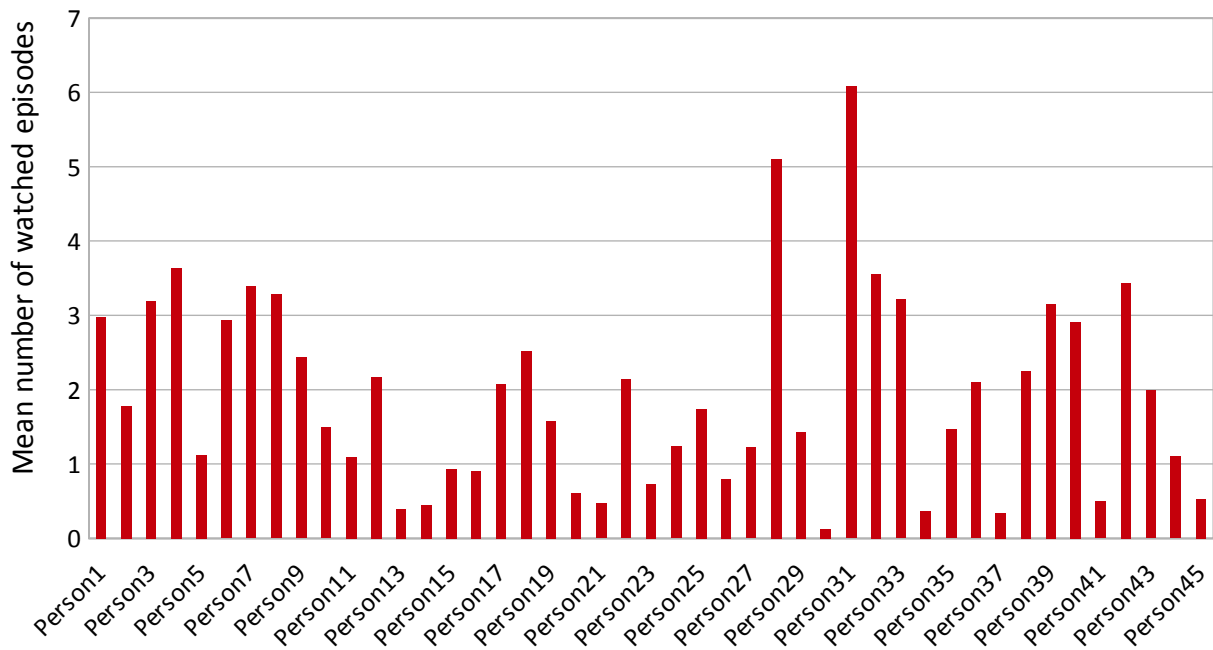


Figure 4. Daily mean number of watched episodes of each participant over the two weeks

However, the daily mean number of watched episodes of the sample on each of the 15 days was not remarkably diverse, but quite stable (Figure 5), with a minimum number of 1.43 episodes (Day 3) and a maximum number of 2.30 episodes (Day 13).

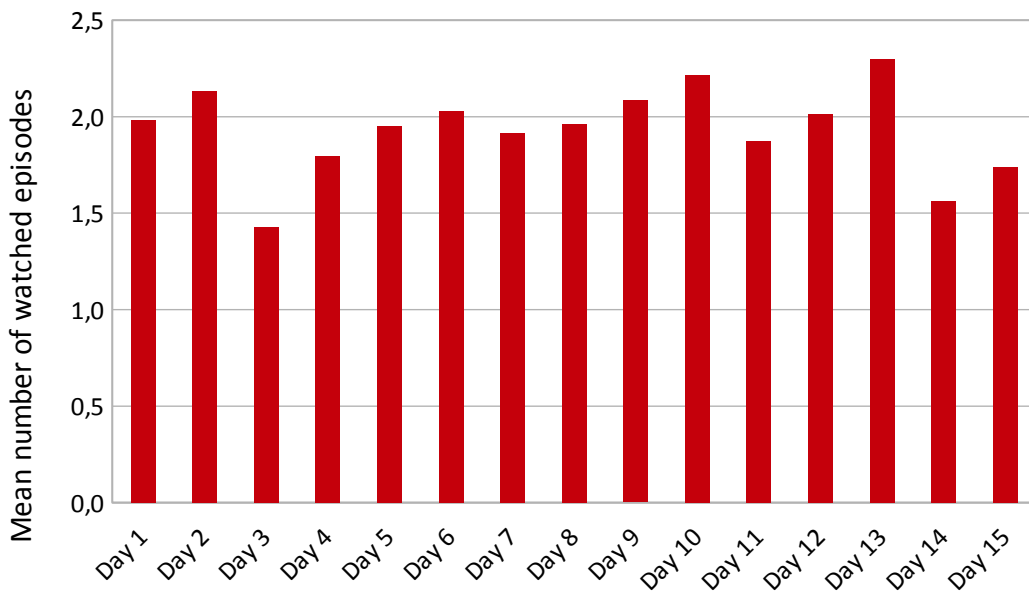


Figure 5. Daily mean number of watched episodes of the sample on each of the 15 days

As one can see, Figure 1 and 4, as well as Figure 2 and 5, resemble each other in appearance, assuming that the minutes spent on watching video streaming content is related to the number of watched episodes. Consistently, a strong positive correlation was found between the

daily mean time each participant spent watching video streaming content and the daily mean number of watched episodes of each participant over the two weeks ( $r=.89, p <.01$ ). Similarly, a strong positive correlation was found between the daily mean watching time of the sample on each of the 15 days and the daily mean number of watched episodes of the sample on each of the 15 days ( $r=.71, p <.01$ ).

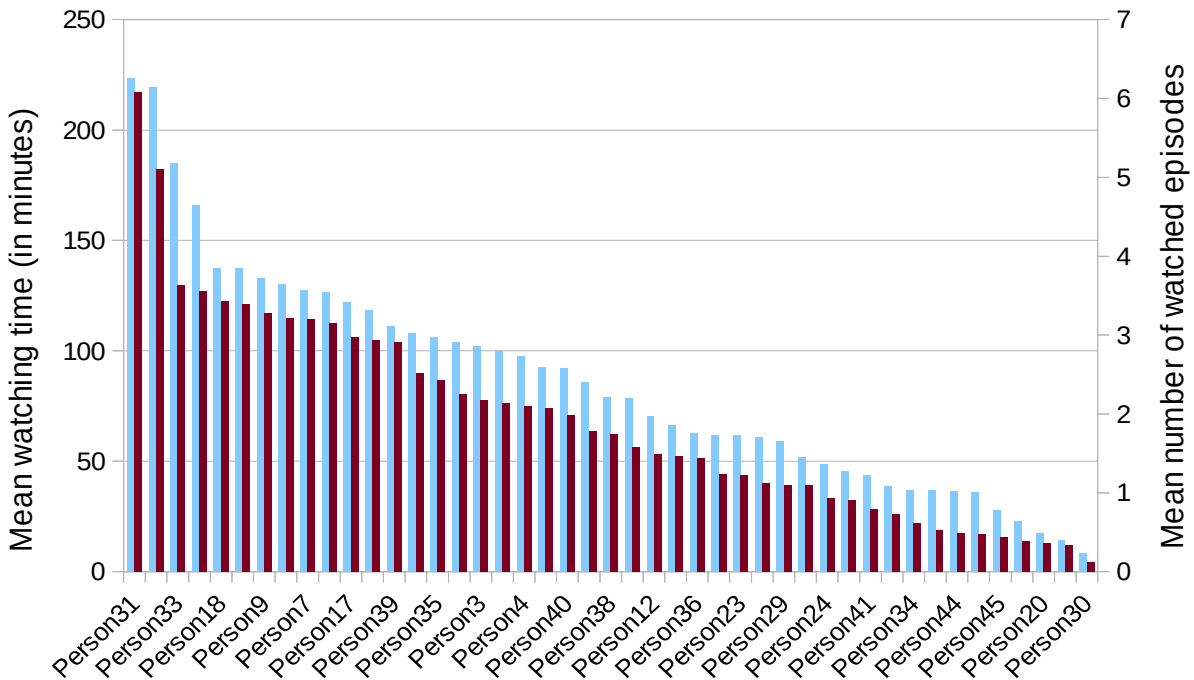


Figure 6. Daily mean watching time of each participant (blue) and daily mean number of watched episodes of each participant during the two weeks (red)

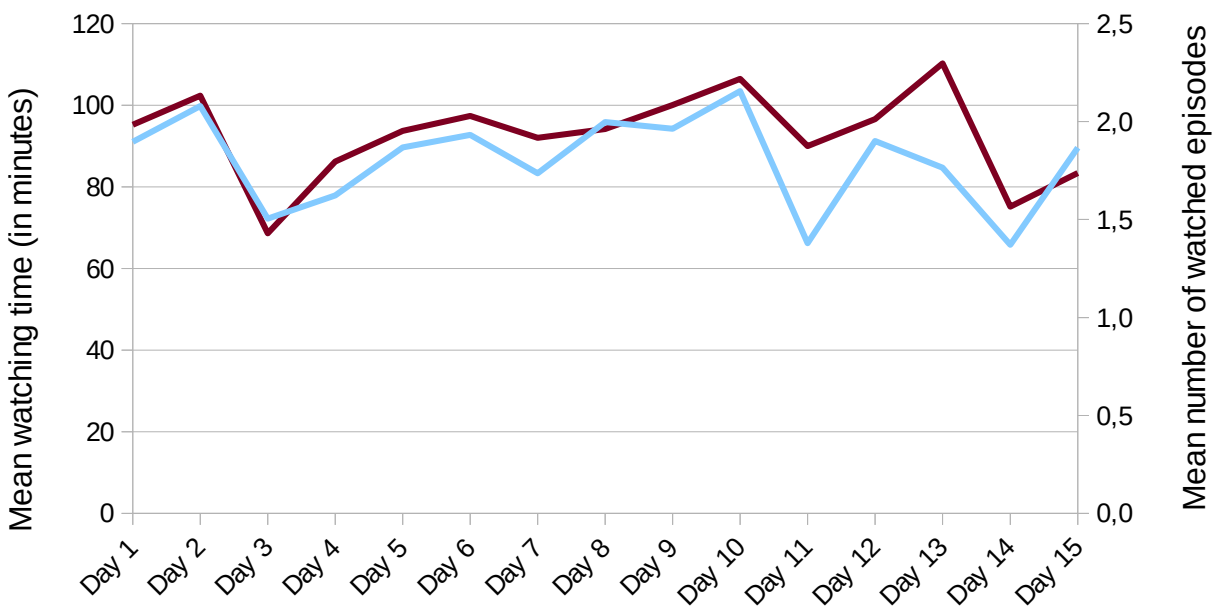


Figure 7. Daily mean watching time of the sample on each of the 15 days (blue) and daily mean number of watched episodes of the sample on each of the 15 days (red)

## **Fixed effects of linear mixed models**

By using Linear Mixed Model analyses, it was explored whether watching video streaming content was associated with daily life activities. The first Linear Mixed Model showed the strongest significant fixed effect for the neglect of academic activities ( $F(1, 499)=39.67, p<.01$ ). A significant fixed effect was also found for the neglect of household activity ( $F(1,461)=22.92, p<.01$ ), the neglect of physical exercise ( $F(1, 496)=13.86, p<.01$ ), and the neglect of social activities ( $F(1, 496)= 10.03, p<.01$ ). Furthermore, LMM analyses were used to assess whether the time spent on watching video streaming content is related to the experience of negative psychological consequences. The three LMMs showed the strongest significant fixed effects for relaxation ( $F(1, 521)=158.15, p<.01$ ) and happiness ( $F(1, 515)=123.28, p<.01$ ). Also a significant, but less strong fixed effect was found for feelings of guilt ( $F(1, 478)= 47.59, p<.01$ ). These results indicate that watching time and neglect of the four daily life activities did covary over time and within persons. Likewise did watching time covary over time and within persons with feelings of guilt, happiness and relaxation.

## **Simple bivariate Post-Hoc correlation between watching time and daily life activities**

### *Pearson's correlation per time point*

To further explore the nature of the association between watching time and the perceived neglect of the four daily life activities, a simple bivariate Post-Hoc correlation analysis of the estimated marginal means was used. None of the Pearson's correlations between time watched per day and the perceived neglect of household activity ( $r=.00, p=.99$ ), physical exercise ( $r=.10, p=.73$ ), academic activity ( $r=.22, p=.42$ ) and social activity ( $r=.18, p=.53$ ) were found to be significant. The findings indicate that the watching time and neglect of the four daily life activities did covary over time and within persons in the LMMs, but simple bivariate correlation of the estimated marginal means did not confirm any significant robust effect. The following figures show the different correlations between the minutes watched per day and participants' perceived neglect on the four daily life activities per day over the two-week study period (Figure 8 – Figure 11).

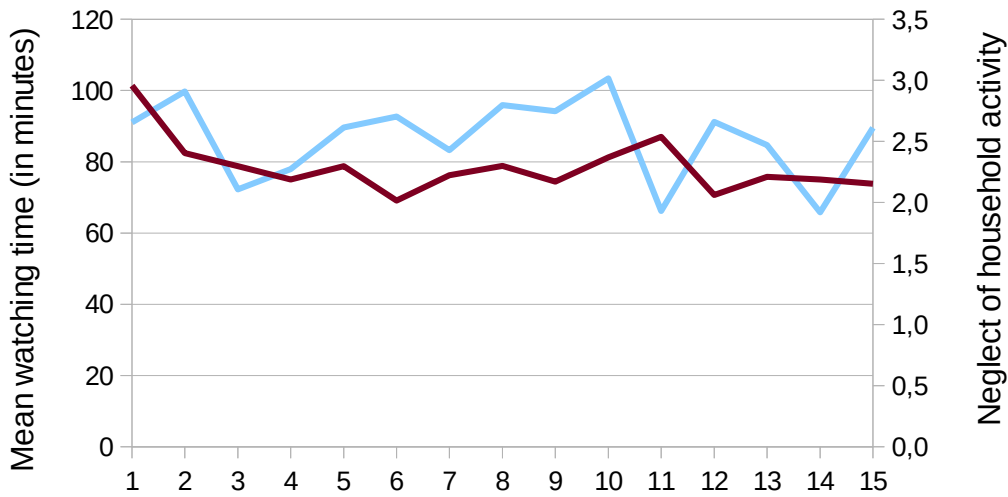


Figure 8. Mean of watching time (blue) and mean neglect of household activity (red) per time point

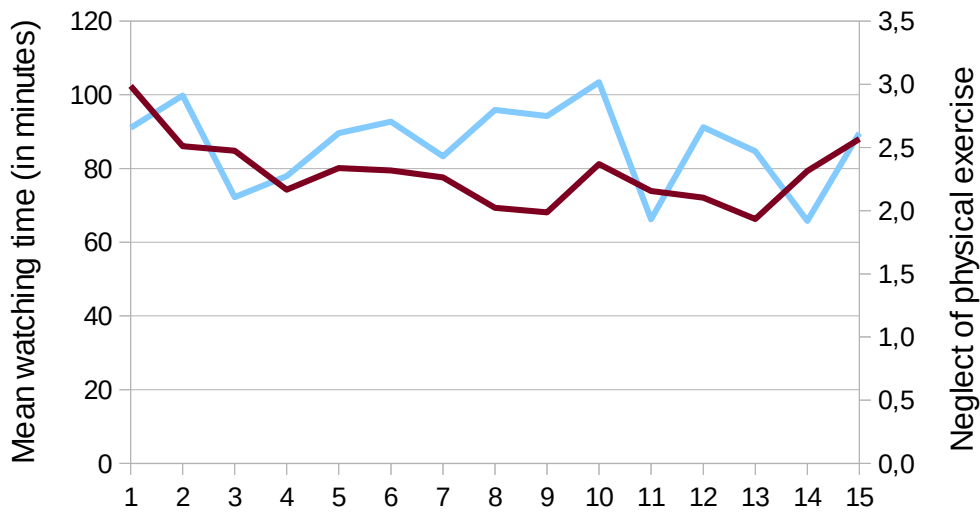


Figure 9. Mean watching time (blue) and mean neglect of physical exercise (red) per time point

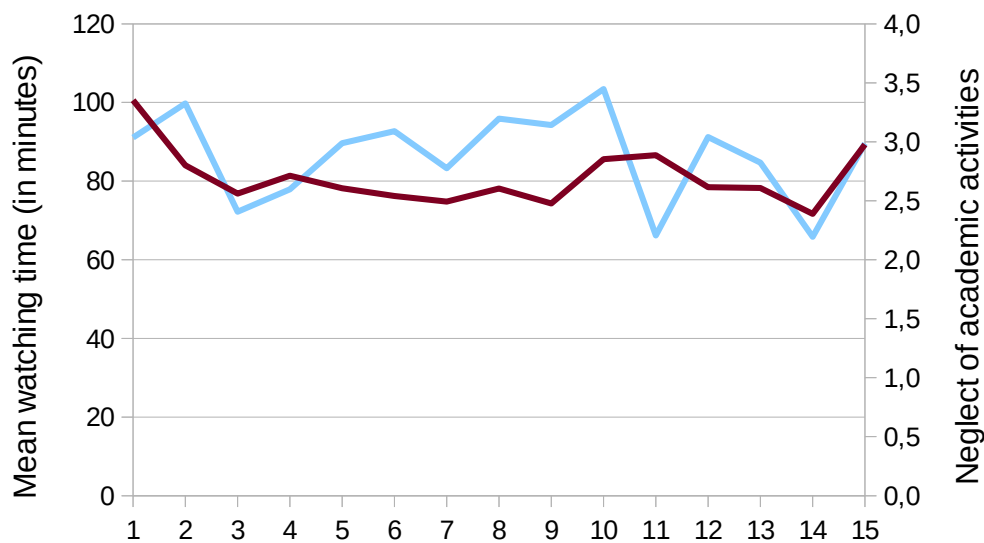


Figure 10. Mean watching time (blue) and mean neglect of academic activity (red) per time point

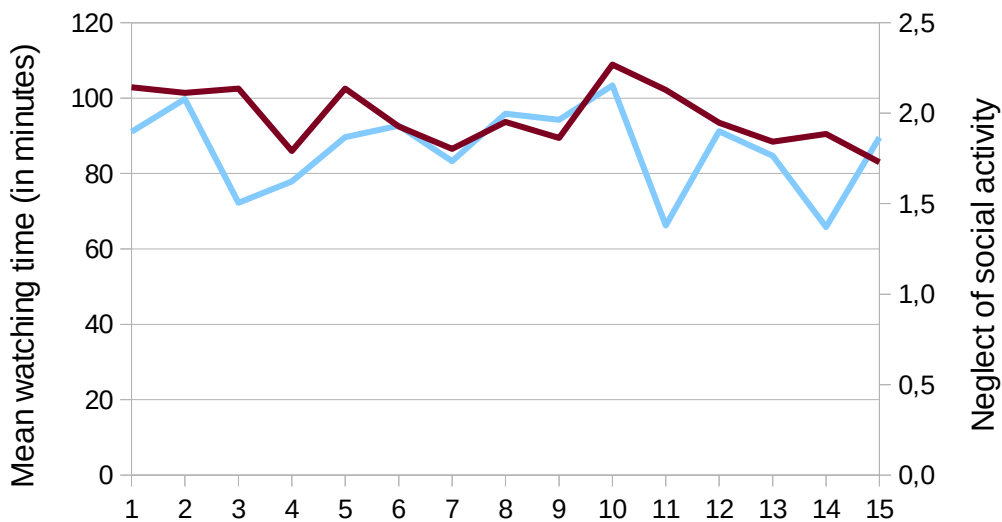


Figure 11. Mean watching time in minutes (blue) and mean neglect of social activity (red) per time point

#### *Pearson's correlation per participant*

The mean of the perceived neglect of the four daily life activities was also estimated for each participant. These estimated marginal means were correlated with the estimated marginal means of time spent watching video streaming content per participants, using a Pearson's correlation. Again, none of the Pearson's correlations between the mean watching time per participant and the perceived neglect of household activity ( $r=.07, p=.64$ ), physical exercise ( $r=-.02, p=.91$ ), academic activity ( $r=-.00, p=.99$ ) and social activity ( $r=.22, p=.15$ ) of each participant were found to be significant. Hence, these simple bivariate correlations of the estimated marginal means per participant did not confirm any significant robust effect, although significant fixed effects were found in the LMMs, indicating that the two variables covary over time and within persons. The graphs illustrating these Pearson's correlations can be found in the Appendix (Appendix E).

#### **Simple bivariate Post-Hoc correlation between watching time and experience of psychological consequences per participant**

To further explore the significant fixed effects of the LMMs for feelings of guilt, happiness and relaxation, a simple bivariate Post-Hoc correlation analysis was used. A Pearson's  $r$  test showed two statistically significant strong correlations. First, participants' watching time was strongly correlated with feeling more happy afterwards ( $r=.54, p < .01$ ), indicating that participants felt more happy after watching video streaming content.

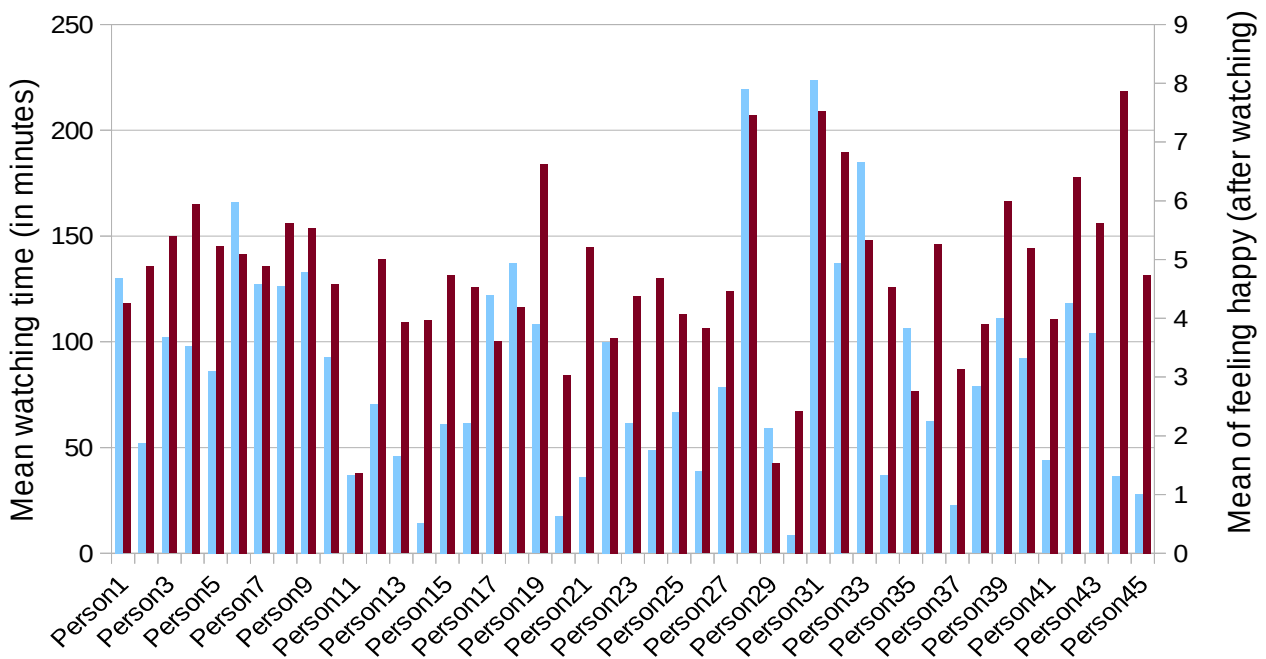


Figure 12. Mean watching time (blue) and mean of feeling happy after watching (red) per participant

Secondly, the Pearson’s r test showed a strong correlation between watching time and relaxation ( $r=.59, p<.01$ ). In other words, participants who watched more video streaming content tend to feel more relaxed afterwards.

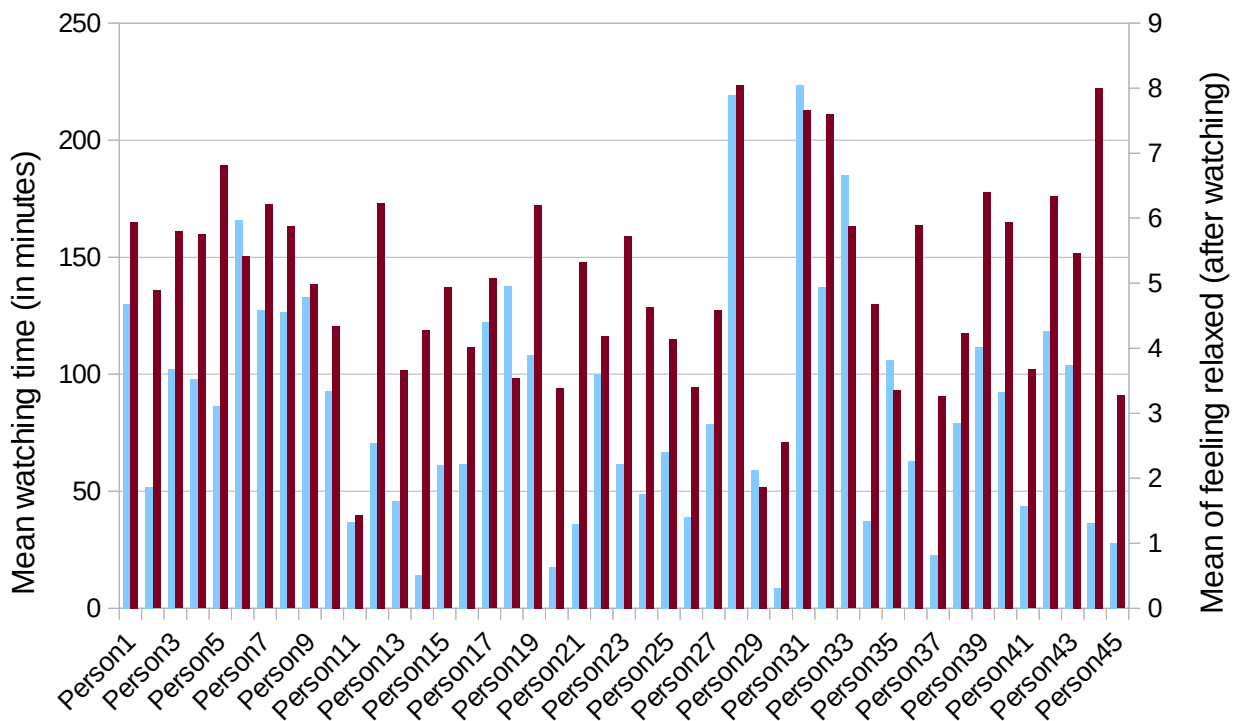


Figure 13. Mean watching time (blue) and mean of feeling relaxed after watching (red) per participant

Finally, Pearson's correlation between the time spent watching and feeling guilty afterwards did not show a statistically significant correlation ( $r=.18, p=.24$ ).

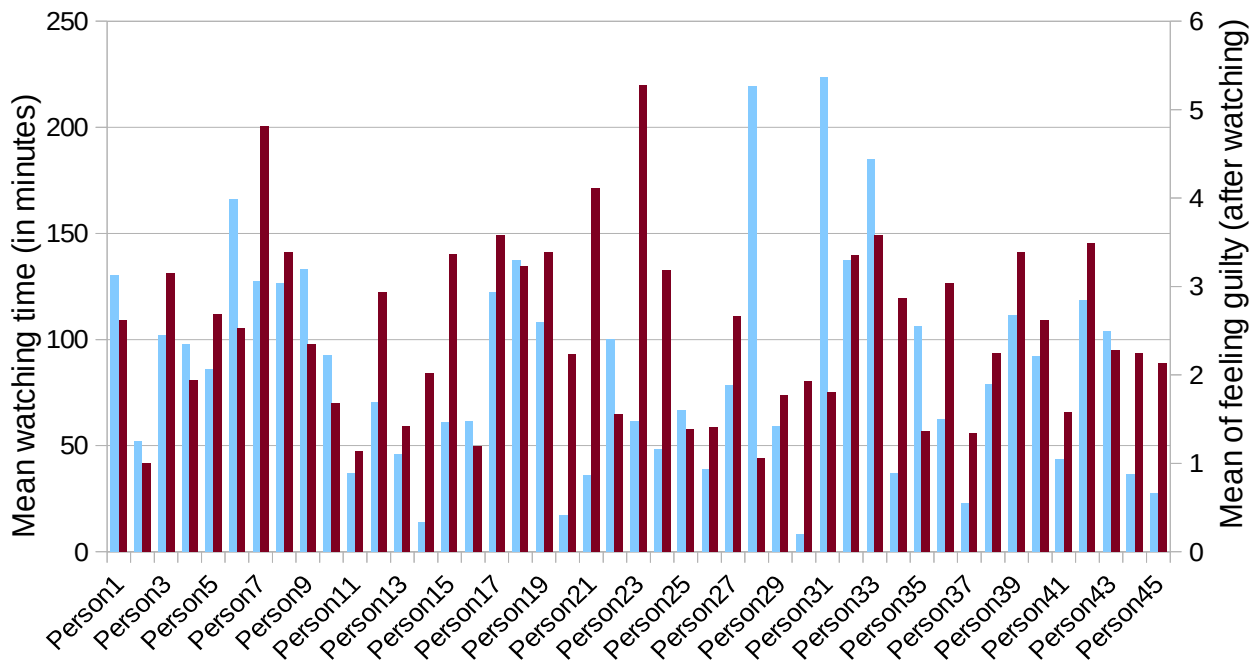


Figure 14. Mean watching time (blue) and mean of feeling guilty after watching (red) per participant

The findings indicate that the significant fixed effects for happiness and relaxation shown in the LMMs, also showed significant robust effects for happiness and relaxation when correlating the estimated marginal means per participant. It indicates that participants who watched more video-streaming content tend to feel more happy and relaxed afterwards. In contrast, simple bivariate correlation on the estimated marginal means of watching time and feelings of guilt per participant did not confirm a significant robust effect.

## Discussion

This is one of the first studies using experience sampling method (ESM) to investigate patterns of binge-watching in relation to its psychological consequences, daily life obligations, and well-being. The aim of this study was to gain a deeper insight into whether the amount of watching video streaming content interferes with the user's daily life activities and to explore possible negative and positive psychological consequences as a result of watching video streaming content.

Overall, the sample as a whole used video on demand streaming services on a very regular basis during the two weeks. On average the sample watched on more than 70% of the days within the two-week study period. The sample, which mainly included students, watched on average 2

episodes in a row each day, contributing to binge-watching as a common, every-day behaviour among student samples (Chastin, DeCraemer, Oppert, & Cardon, 2017; Riddle et al., 2018). However, a strong diversity of the mean watching time between the 45 participants was observed, indicating that on an individual level the amount of watching time is very different for each participant. Moreover, the study showed that the neglect of the four daily life activities covaried significantly with watching video streaming content in the LMMs. However, the crude Post-Hoc analyses on the estimated means did not shed light on the nature of this association. In other words, the crude Post-Hoc analyses for within-subjects and over time, did not show whether time spent on watching video streaming content and the neglect of the four daily life activities were positively or negatively associated. Furthermore, the study revealed that feeling happy and relaxed covaried significantly with watching video streaming content and the crude Post-Hoc analyses of the estimated means confirmed a significant robust effect. This indicates that the participants tend to feel more happy and relaxed after watching video streaming content. Consequently, the study showed that positive psychological consequences are strongly associated with watching video streaming content. However, no robust evidence for negative psychological consequences as a result of watching video streaming content were found.

During the two-weeks the sample watched on average 2 episodes in a row per day. In 44% of the 15 days the sample watched on average two or more episodes in one sitting. Based on the current state of research, this finding suggests that the samples' watching behaviour showed tendencies of binge-watching. Since recent studies defined binge-watching as watching at least two or more episodes in one single sitting (Flayelle et al., 2019; Pittmann & Sheehan, 2015; Walton-Pattison et al., 2016), the participants slightly tend to engage in this phenomenon. Moreover, at the group level, the observed patterns of the sample's watching behaviour during the two weeks is remarkably stable, seemingly habitual and form a part of their daily life. However, this is not the case when regarding the sample on the individual level. The mean watching time varied extremely between the 45 participants. Some participants did not use video on-demand streaming services very often and displayed a very low amount of time watched during the two weeks. On the other hand some participants spent extremely much time on watching video streaming content. In particular, one participant watched up to 6 hours a day with a daily average of 3.5 hours during the two weeks. Such extreme cases might be at risk with regards to their well-being, since Sung et al. (2015) found that people who often engage in binge-watching are likely to get addicted. The more time people spend on binge-watching, the higher their likelihood to continue watching subsequently, hence it is leading the way for a vicious cycle (Panda & Pandey, 2017). Discovering



those extreme cases might be helpful to reduce their potential risk of being pulled in such a viscous cycle resulting in addiction.

The participants of this study were mainly students (75.6%) and under the age of 25. This sample seems an interesting group for further investigation, since recent studies showed that streaming platforms such as Netflix are mostly used by younger individuals under the age of 25 and that university students are the main population engaging in binge-watching (Chastin, DeCraemer, Oppert, & Cardon, 2017; Riddle et al., 2018).

As mentioned above, it was found that watching video streaming content and the neglect of the four daily life activities were associated in the LMM analyses. However, the crude Post-Hoc analysis could not reveal any significant robust effect, therefore no information regarding the nature of the association could be discovered. Important to consider in this case, is that the sample size for the simple bivariate Post-Hoc correlation analyses was highly underpowered – especially for the analyses per time point (N=15) – indicating that the sample size is too small to present significant effects. The study included 45 participants, which is in fact very large for ESM studies. Hence, the analysis approach itself might not be the most feasible in this case. Selecting a simple bivariate correlation analysis to discover the association between the two variables, naturally tests for a *linear* trend, which might be more suitable for intervention studies. Therefore, it can be stated that no *linear* association was found, and the true nature of the association between watching video streaming content and daily life activities could not be demonstrated.

The findings can be regarded as partly in line with current research. Winland (2015) revealed that watching media content distracts from academic activities, but no correlation between binge-watching and academic engagement was demonstrated. Likewise, the present study revealed that the neglect of academic activities and watching time was associated the most strongest in comparison to the other three daily life activities. However, again the simple bivariate Post-Hoc correlation analysis did not show whether academic activities are more or less neglected due to watching video streaming content. Therefore, further studies need to confirm whether watching video streaming content distract students from academic activities and other daily life obligations.

Moreover, the present study aimed at extending the findings on whether binge-watching has a negative impact on daily life activities of younger individuals. The study by Flayelle et al. (2017) used a focused group and demonstrated that most participants did not identify binge-watching as having a negative effect on daily living. However, the direct negative influence of binge-watching on daily activities remained uncertain. Similarly, the present study, could not robustly extend the findings by Flayelle et al. (2017), in terms of whether watching video streaming content results in engaging less in daily life activities than planned, thus initiating a negative impact on daily living.

Still, significant fixed effects in the LMM were found, indicating that watching video streaming content and the neglect of daily life activities are related. Nevertheless, as previously mentioned no simple *linear* association was confirmed by the crude Post-Hoc analysis.

As mentioned earlier, simple bivariate correlation analysis showed that spending more time on watching video streaming content made participants feel more happy and relaxed afterwards. However, the study did not robustly show whether participants felt more or less guilty after watching video streaming content. Again, the limited sample size was highly underpowered for the analysis strategy to reveal significant effects. Hence, the study could not demonstrate whether watching a high amount of video streaming content can result in negative psychological consequences. These results can be regarded as partly in line with some state of research. On the one hand, since participants seem to feel more happy and relaxed after watching a high amount of video streaming content, this finding agrees to the theory of Zillmann and Bryant, (1985). They revealed that individuals chose media content to enhance their mood. In addition, Rubenking et al. (2018) found that one major motivational factor to engage in binge-watching is to manage one's mood and to relax. The present study in fact confirms that participants mood enhances in terms of feeling happy and relaxed after having watched video streaming content. Consistently, Pittmann & Sheehan (2015) identified that relaxation is one of the main motivations for individuals to indulge in binge-watching.

On the other hand, simple bivariate correlation analysis could not reveal whether participants felt more or less guilty after watching video streaming content. Reinecke et al. (2014) revealed that media consumption at the cost of other goals can result in feelings of guilt and that guilt in turn can decrease situational well-being. However, the present study did not detect if watching video streaming content happened at the cost of other goals or responsibilities, thus it remains uncertain whether feelings of guilt occur solely as a result of binge-watching. Also, the study did not show whether watching video streaming content results in experiencing negative psychological consequences and in turn may affect participants' well-being negatively as found by Sung et al. (2015). In their study it was demonstrated that binge-watching can affect individuals well-being, especially in terms of addiction and thus results in depression, less self-control and loneliness.

Therefore, it would be interesting to gain insights into why people seemingly feel more happy and relaxed, but not necessarily more guilty after binge-watching. A possible explanation might be that the convenience sample, which mainly included students who appear to be highly educated, was too 'normal' or rather 'well-controlled', not representing an at risk population prone to feeling guilty after binge-watching. For instance, individuals who highly depend on the internet

tend to have interpersonal difficulties and stress in reality, therefore avoiding reality by escaping into media (Whang, Lee, & Chang, 2003). Likewise, students who are more nervous and anxious may use binge-watching in order to escape reality. The more they find comfort in binge behaviour the more they start escaping reality, getting further addicted to media consumption (Panda & Pandey, 2017). Therefore, those individuals might be more at risk to feel guilty after binge-watching. Moreover, guilt means to feel bad and is understood as an unpleasant arousal (Baumeister, Stillwell, & Heatherton, 1994). Since the present study revealed that people tend to feel better after watching video streaming content in terms of happiness and relaxation, it contradicts the unpleasant arousal and bad feelings guilt is identified with. One further explanation might be that participants experienced what is called cognitive dissonance reduction. Cognitive dissonance reduction refers to a psychological state of tension that people prefer to reduce (Festinger, 1957). Since the participants were asked the same questions regarding their watching behaviour every day over the course of two weeks, they might find themselves in a state of discomfort leading them to alter their behaviour or feelings regarding watching video streaming content.

Overall, it seems remarkable that in this case ‘positive’ psychological consequences (happiness and relaxation) are so strongly correlated with binge-watching, while the daily life activities were not even close to a significant robust effect when regarding the simple bivariate correlations. One possible explanation is that binge-watching behaviour seemingly accounts for a certain part of the participants’ daily life, as their pattern of watching behaviour was noticeably stable during the two weeks. Nevertheless, this is only true when regarding the sample as a whole during the study period, ignoring between-subject differences. Taking that into account, watching video streaming content in general may not coercively distract people from their daily life obligations but is used for efficient leisure time. They might effectively integrate binge-watching as a usual daily life activity, facilitating to manage daily life activities without vigorously neglecting them. Also, participants might replace traditional TV with watching video streaming content, as it offers more control and choice on watching preferred content (Shim & Kim, 2018), which contributes to the steady decline of watching traditional, linear TV (Luckerson, 2014).

Furthermore, it needs to be considered that the items measuring the neglect of daily life activities did not include a direct attribution to watching video streaming content in its formulation, compared to the items measuring psychological consequences. The items measuring psychological consequences were formulated to assess the feelings produced *after* watching video streaming content, making it likely that they reflect an effect of generated feelings after watching. In contrast, the items measuring the neglect of the four daily life activities did not include such attribution to

watching, meaning that they were not specifically measured as a response to watching video streaming content. This creates an artefact, as a result of less sensitive measurement, producing a misleading picture of the to be investigated behaviour. This in turn might be a reason why the four daily life activities were not close to a significant robust effect when regarding the simple bivariate correlation analyses.

The present study is one of the first using ESM to investigate the patterns of watching video streaming content. By using this relatively novel method it was possible to investigate participants' watching behaviour in real life and real time. ESM enabled to repeatedly measure participants' watching behaviour in their natural environment for a period of two weeks, thus allowing for a longitudinal study. The method allowed to examine the effects either based on the time point or based on each participant, hence providing more precise information about watching behaviour. For example, the study enabled to detect intra-individual fluctuations of the participants' watching behaviour in their daily life. Furthermore, this quantitative research method is assumed to decrease global and recall bias, by reducing the reliance on retrospective memory (Scollon, Kim-Prieto, & Scollon, 2003) Moreover, test-retest reliability can be assumed, as the watching time in week one is similar to that in week two, indicating a very stable, habitual pattern of watching behaviour when regarding the sample as a whole, ignoring between-subject differences. In addition, validity of the used measurements can be assumed, since a strong correlation was found between the time participants watched video streaming content and the number of watched episodes, indicating that the participants filled in the daily questions seriously and accurately. Overall, the research method permitted that the findings were more representative for the participants' daily living. Finally, the use of the TIIM application enabled to design the longitudinal experience sampling study. The used measurements provided via the TIIM application were mainly self-constructed, but seemed apprehensive and feasible, as participants responded on 73% of the 15 days requested.

### **Limitations and Future Research**

Besides the demonstrated benefits of the study offered by ESM, the research method implicates to be very time consuming for the participants and therefore may have influenced their respondent rates. For instance, some participants did not fill out the questionnaires on each day as requested, resulting in missing data. Moreover, due to the extensive design of the study, some participants might have been prone to select inaccurate options simply to reduce their time or work load needed for the study, which is referred to as careless responding.

One major limitation of this study regards the choice of data analysis. A simple bivariate Post-Hoc correlation analysis was used to further explore the nature of the association found in the

LMM analyses. However, as previously explained, this analysis approach did not provide clear information on the nature of the association between watching time and the neglect of the four daily life activities. The Pearson's correlations suffered from the limited sample size revealing no significant robust effects. Furthermore, by using simple bivariate correlation analysis, it is naturally tested for linear effects over time between two variables, which were not confirmed in the present study. Testing for a linear correlation might not be the most feasible option in this case, consequently crucial evidence on specific days might have been ignored. It is essential to be aware that linear relationships are fairly common in daily life and that reality is more complex, suggesting that the true association might depend on third variables, such as context or personal characteristics, that were not taken into account in the present study. On that account, further research should try to use different analyses and take other influences into consideration, in order to provide more clear findings on the nature of the association between watching time and the neglect of daily life activities. Future research should test which analysis approach is the most appropriate.

As previously discovered, the sample as a whole showed a very stably, seemingly habitual pattern of watching video streaming content, suggesting that it forms an essential part of their daily life. Nevertheless, this only holds when regarding the sample on the group level, ignoring between-subject differences. On an individual level, the participants displayed a very diverse pattern of watching, with some participants watching extremely high and some extremely low amounts of video streaming content. Therefore, these findings are not in line with each other but rather contradictory. Therefore, it might be more interesting for future research to examine the samples' weakly patterns of watching video streaming content and search for sub-groups that display similar patterns.

A further limitation of this study needs to be considered. The items used within the study were mostly self-constructed, hence may lack validity. In particular, the items measuring the experience of negative psychological consequences were only partly based on a valid measurement such as the PANAS. The items measuring happiness and relaxation could have been changed into items also based on the PANAS, to ensure that the correct construct – in this case negative affect – is measured. Hence, the items might represent a more valid measure of negative psychological consequences. In addition, as previously mentioned, the items measuring the neglect of daily life activities were not formulated in direct relation to watching video streaming content when compared to the items measuring psychological consequences. This might also be a reason why significant robust effects of the bivariate correlations were not confirmed. Therefore, a better approach for subsequent studies might be to formulate the items differently, in a sense that daily life activities were neglected *due to* watching video streaming content.

Moreover, the researchers were confronted with several complications regarding the utility of the TIIM application. First, the TIIM app is only available for mobile devices with Android or IOS, thus the exclusion of potential participants using mobile devices with a different software was unavoidable. Furthermore, the TIIM app featured some technical errors which impeded the research process. For instance, participants reported difficulties to complete some questions, hence the researchers were forced to change the design of the answer options of some items.

Furthermore, this study might have acted as an intervention for binge-watching, in terms of measurement reactivity. Participants needed to complete the same questionnaires each day for 15 days, hence some participants may altered their watching behaviour as they got more aware of it. Finally, another bias might have influenced the results of the study. The participants were mainly friends or family, thus well known by the researcher. Therefore, it could be the case that certain participants answered in a favourable way, since they knew that the researcher was able to monitor their actions.

Still, several questions regarding the research of binge-watching behaviour remain uncertain. For further research it is recommended to use ESM as a research method as it enables longitudinal measurements of behaviour in individuals' natural environment. Besides, more studies should investigate at risk populations, by observing people who are already concerned about their binge-watching behaviour prone to a potential addiction. Those studies may detect extremere detrimental patterns of binge-watching which in turn can be distinguished from more habitual behaviour. In addition, it is important to explore adverse behavioural patterns of binge-watching in order to prevent detrimental effects on individuals' well-being.

Future research should also continue to investigate feelings or mood states related to binge-watching. One appropriate approach, when using ESM, would be to measure momentary feelings of individuals separately by asking them multiple times a day how they feel and subsequently relate those to their time spent on watching video streaming content. Hence, a more objective measure of feelings related to watching video streaming content could be generated rather than measuring subjective attributions of causality as in the present study. Finally, although the present study used ESM, the daily questionnaire about watching behaviour was still designed in a retrospective manner, therefore *immediate* feelings or behaviours after having watched video streaming content were not exactly measured. It seems impossible to measure binge-watching behaviour at real time and in particular feelings immediately generated after having binge-watched. Therefore, further studies using ESM should attempt to investigate binge-watching and related feelings at real time more accurately. For instance, further research may collaborate with streaming services such as Netflix, which might be able to exactly monitor and record individuals' watching behaviour in real

life and at real time. Nevertheless, ethical issues need to be considered, since it is an extremely invasive method to measure individuals' behaviour.

To conclude, the present study provided deeper insight into behavioural patterns of binge-watching. It seems that binge-watching is seen as a leisure activity and forms a substantial part of daily living for younger individuals. Finally, the present study suggests that watching more video streaming content makes people feel more happy and relaxed. Binge-watching might be not something harmful as commonly assumed, but rather becomes a gratification people want in their lives.

## References

- Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1994). Guilt: An interpersonal approach. *Psychological Bulletin*, *115*(2), 243-267. doi:10.1037//0033-2909.115.2.243
- Chastin, S. F., DeCraemer, M., Oppert, J., & Cardon, G. (2017). Dynamics of Sedentary Behaviours and Systems-Based Approach: Future Challenges and Opportunities in the Life Course Epidemiology of Sedentary Behaviours. *Sedentary Behaviour Epidemiology*, 595-616. doi:10.1007/978-3-319-61552-3\_26
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. London, England: Routledge.
- Festinger L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson
- Flayelle, M., Maurage, P., & Billieux, J. (2017). Toward a qualitative understanding of binge-watching behaviors: A focus group approach. *Journal of Behavioral Addictions*, *6*(4), 457-471. doi:10.1556/2006.6.2017.060
- Flayelle, M., Maurage, P., Vögele, C., Karila, L., & Billieux, J. (2018). Time for a plot twist: Beyond confirmatory approaches to binge-watching research. *Psychology of Popular Media Culture*. doi:10.1037/ppm0000187
- Flayelle, M., Canale, N., Vögele, C., Karila, L., Maurage, P., & Billieux, J. (2019). Assessing binge-watching behaviors: Development and validation of the “Watching TV Series Motives” and “Binge-watching Engagement and Symptoms” questionnaires. *Computers in Human Behavior*, *90*, 26-36. doi:10.1016/j.chb.2018.08.022
- Granow, V. C., Reinecke, L., & Ziegele, M. (2018). Binge-watching and psychological well-being: media use between lack of control and perceived autonomy. *Communication Research Reports*, *35*(5), 392-401. doi:10.1080/08824096.2018.1525347



- Griffee, S. (2013, February 13). Netflix, 'binge-watching' shift TV viewing habits. USA Today. Retrieved from <http://college.usatoday.com/2013/02/13/netflix-binge-watching-shift-tv-viewing-habits/>
- Katz, E., Blumler, G. J., & Gurevitch, M. (1973). Uses and gratifications research. *The Public Opinion Quarterly*, 37(4), 509–523.
- Larson, R., & Csikszentmihalyi, M. (2014). The Experience Sampling Method. *Flow and the Foundations of Positive Psychology*, 21-34. doi:10.1007/978-94-017-9088-8\_2
- Luckerson, V. (2014, December 3). Here's proof television is slowly dying. TIME Business. Retrieved from <http://time.com/3615387/tv-viewership-declining-nielsen/>
- Louise, A. (2016, November 21). Will Netflix Eradicate Cable TV? Retrieved from <https://www.theodysseyonline.com/will-netflix-eradicate-cable-tv>
- Mohr, K. A. (2017). Understanding Generation Z students to promote a contemporary Learning environment. *Journal on Empowering Teaching Excellence*, 1(1), 9.
- Panda, S., & Pandey, S. C. (2017). *binge-watching and college students: motivations and outcomes*. *Young Consumers*, 18(4), 425–438. doi:10.1108/yc-07-2017-00707
- Perks, L.G. (2014). *Media Marathoning: Immersions in Morality*. Lanham, MD: Lexington Books.
- Pittman, M., & Sheehan, K. (2015). Sprinting a media marathon: uses and gratifications of binge-watching television through Netflix. *First Monday*, 20(10). doi:10.5210/fm.v20i10.6138
- Riddle, K., Peebles, A., Davis, C., Xu, F., & Schroeder, E. (2018). The addictive potential of television binge watching: Comparing intentional and unintentional binges. *Psychology of Popular Media Culture*, 7(4), 589-604. doi:10.1037/ppm0000167
- Rubeking, B., Bracken, C. C., Sandoval, J., & Rister, A. (2018). *Defining new viewing behaviours: What makes and motivates TV binge-watching? International Journal of Digital Television*, 9(1), 69–85. doi:10.1386/jdtv.9.1.69\_1

- Scollon, C. N., Kim-Prieto, C., & Scollon, C. N. (2003). Experience sampling: promises and pitfalls, strengths and weaknesses. *Journal of Happiness Studies*, 4(1), 5-34. doi:10.1023/a:1023605205115
- Shim, H., & Kim, K. J. (2018). An exploration of the motivations for binge-watching and the role of individual differences. *Computers in Human Behavior*, 82, 94-100. doi:10.1016/j.chb.2017.12.032
- Sung, Y. H., Kang, E. Y., & Wee, L. (2015). A bad habit for your health? An exploration of psychological factors for binge-watching behavior. Paper presented at the 65th ICA Annual Conference, San Juan, Puerto Rico.
- TIIM (The Incredible Intervention Machine). (2018, April 18). Retrieved from <https://bmslab.utwente.nl/knowledgebase/tiim/>
- Wagner, C. N., "Glued to the Sofa": Exploring Guilt and Television Binge-Watching Behaviors" (2016). Communication Honors Theses. 11
- Walton-Pattison, E., Dombrowski, S. U., & Pesseau, J. (2016). 'Just one more episode': Frequency and theoretical correlates of television binge watching. *Journal of Health Psychology*, 23(1), 17-24. doi:10.1177/1359105316643379
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, 54(6), 1063.
- Whang, L. S., Lee, S., & Chang, G. (2003). Internet over-users' psychological profiles: A behavior sampling analysis on internet addiction. *CyberPsychology & Behavior*, 6(2), 143-150. doi:10.1089/109493103321640338

- Willens, M. (2013, May 2). Face it: Binge-viewing is the new date night. The Huffington Post.  
Retrieved from [https://www.huffingtonpost.com/michele-willens/binge-watching-downton-abbey-breaking-bad-house-of-cards\\_b\\_2764830.html?guccounter=1](https://www.huffingtonpost.com/michele-willens/binge-watching-downton-abbey-breaking-bad-house-of-cards_b_2764830.html?guccounter=1)
- Winland, C. (2015). An exploration of binge-watching and its effects on college academics. *Pediatrics*, 75(5), 807-812.
- Zillmann, D., & Bryant, J. (1985). *Selective exposure to communication*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

## Appendices

### Appendix A: Informative Email for participants

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 29th of April until the 13th of May (2 weeks in total). In general, our goal is to explore the sparsely researched topic of binge-watching. 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 **four different questionnaires a day** at:

- **09:00 a.m.** (2 questionnaires; max. 5 minutes)
- **03:00 p.m.** (max. 2 minutes)
- **09:00 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 subscription-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 Email address, you can choose an own password, which you will use to login in the TIIM app  
→ <https://app.tech4people-apps.bms.utwente.nl/enrol/KZgBQ>
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 not registered until the 29th of April at 08:00 in the morning, you won't be able to participate in the study. You should receive the first notification at 9:00 a.m. on the 29th 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. 8 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 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*. We will reply as soon as possible.

Best regards,  
Hannah, Josefine, Laura, and Florian

## **Appendix B: online informed consent provided via the TIIM application**

### **INFORMED CONSENT**

Florian Cordts, Laura Seifert, Josefine Sundermann, Hannah Troles

Contact: *f.cordts@student.utwente.nl*, *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 television 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.

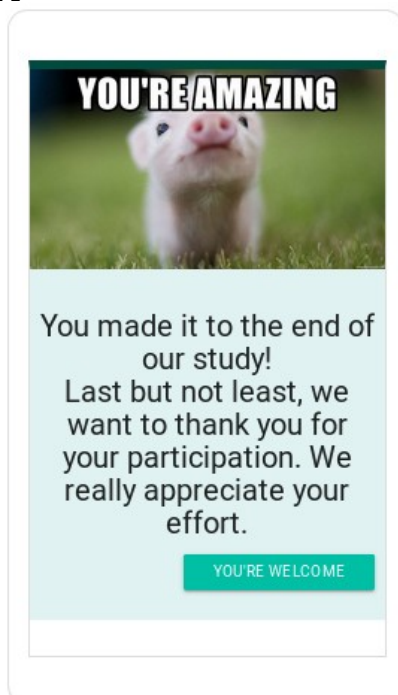
### **VOLUNTARY PARTICIPATION**

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 C: Final notification on the TIIM application**



## Appendix D: Retrospective questionnaire TIIM application

The image displays four screenshots of a mobile application questionnaire, arranged in a 2x2 grid. Each screenshot shows a question in a light blue header bar and response options below.

**Top Left Screenshot:** The question is "Did you watch video streaming content?" with a subtext "(Netflix, Youtube, Amazon Prime, Sky, ...)". The response options are two checkboxes: "yes" and "no".

**Top Right Screenshot:** The question is "How many episodes did you watch?". The response options are shown in a dropdown menu: "I did not watch anything", "I watched a movie(s)", "less than 1 episode", "1 episode", "2 episodes", "3 episodes", and "4 episodes".

**Bottom Left Screenshot:** The question is "How many minutes did you watch?". The response options are shown in a dropdown menu: "I did not watch anything", "1-30 minutes", "1 hour", "1.5 hours", and "2 hours".

**Bottom Right Screenshot:** The question is "I spent less time than planned on household activities". The response options are five checkboxes: "strongly agree", "agree", "neither agree nor disagree", "disagree", and "strongly disagree".

I spent less time than planned on physical exercises

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

I spent less time than planned on academic activities

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

I spent less time than planned on social activities

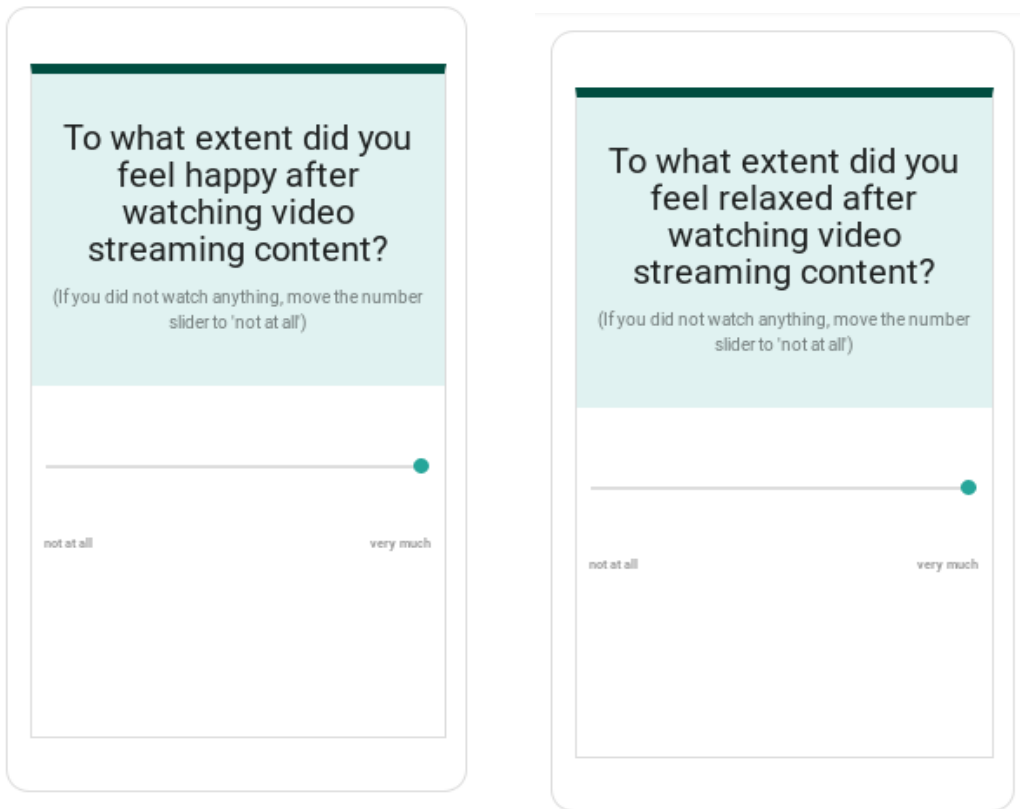
- strongly agree
- agree
- neither agree nor disagree
- disagree
- strongly disagree

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')







**Appendix E: Mean watching time and the four daily life activities per participant over the two weeks**

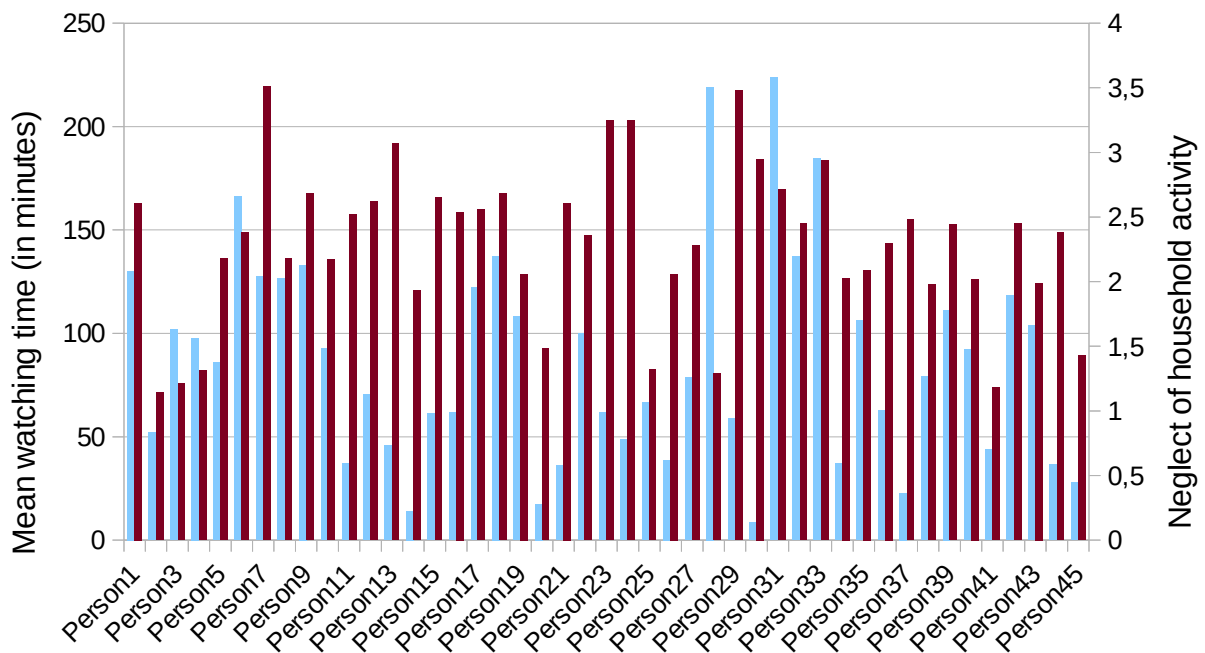


Figure 1. Mean watching time per participant (blue) and mean neglect of household activity (red) per participant

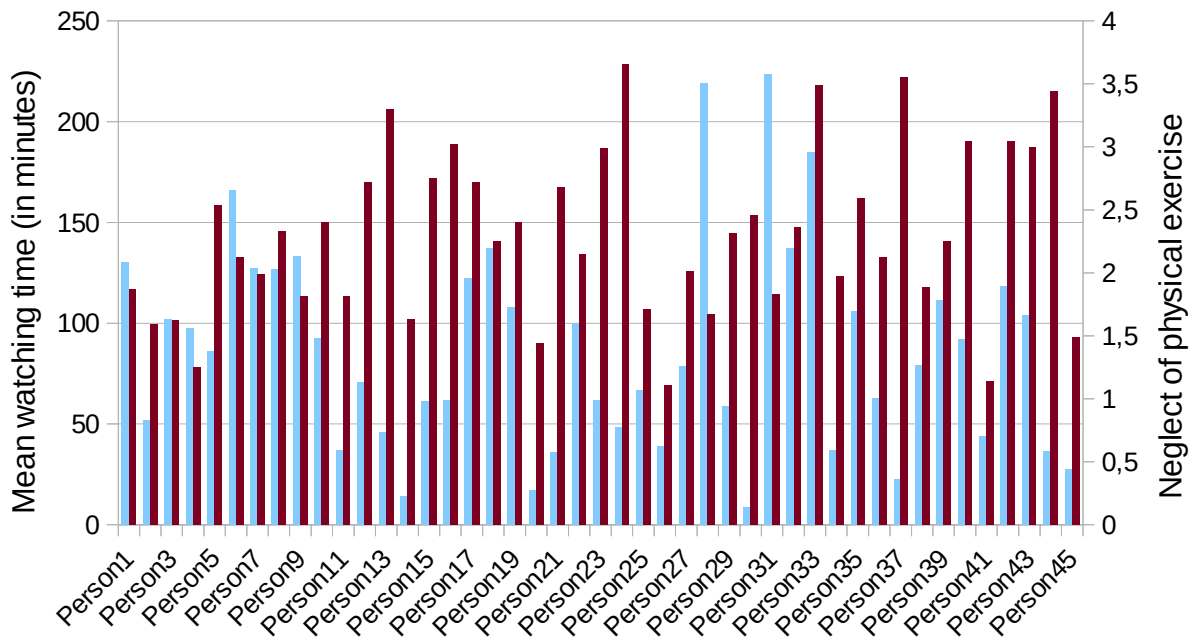


Figure 2. Mean daily watching time (blue) and mean neglect of physical exercise (red)

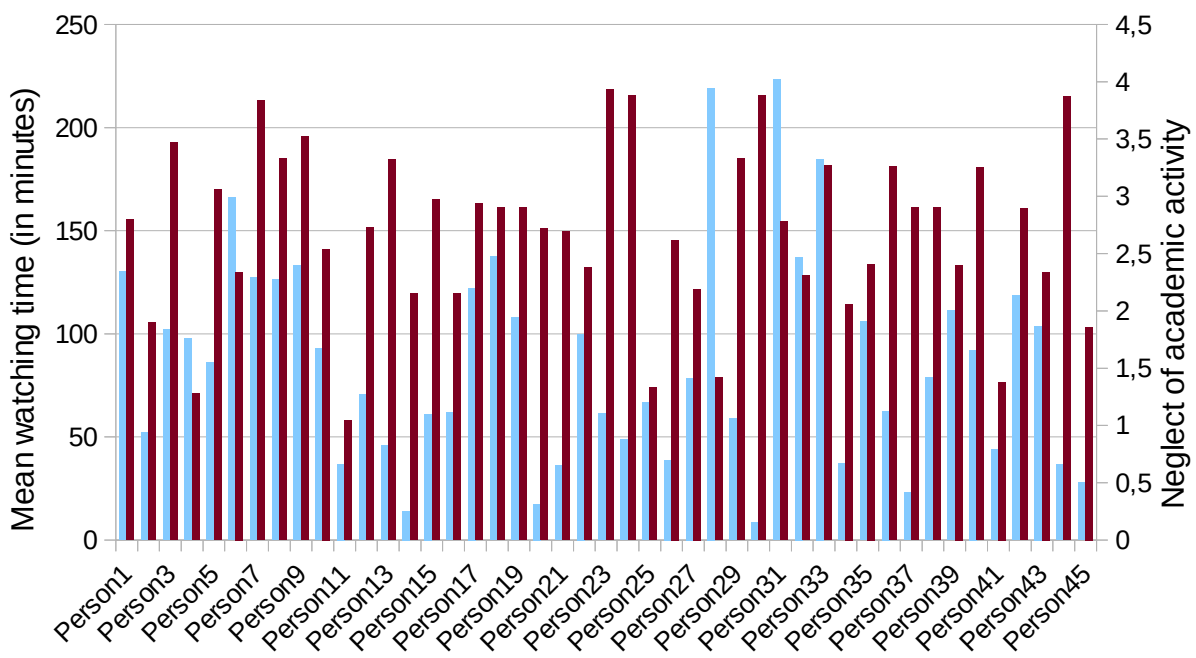


Figure 3. Mean daily watching time (blue) and mean neglect of academic activity (red) per participant

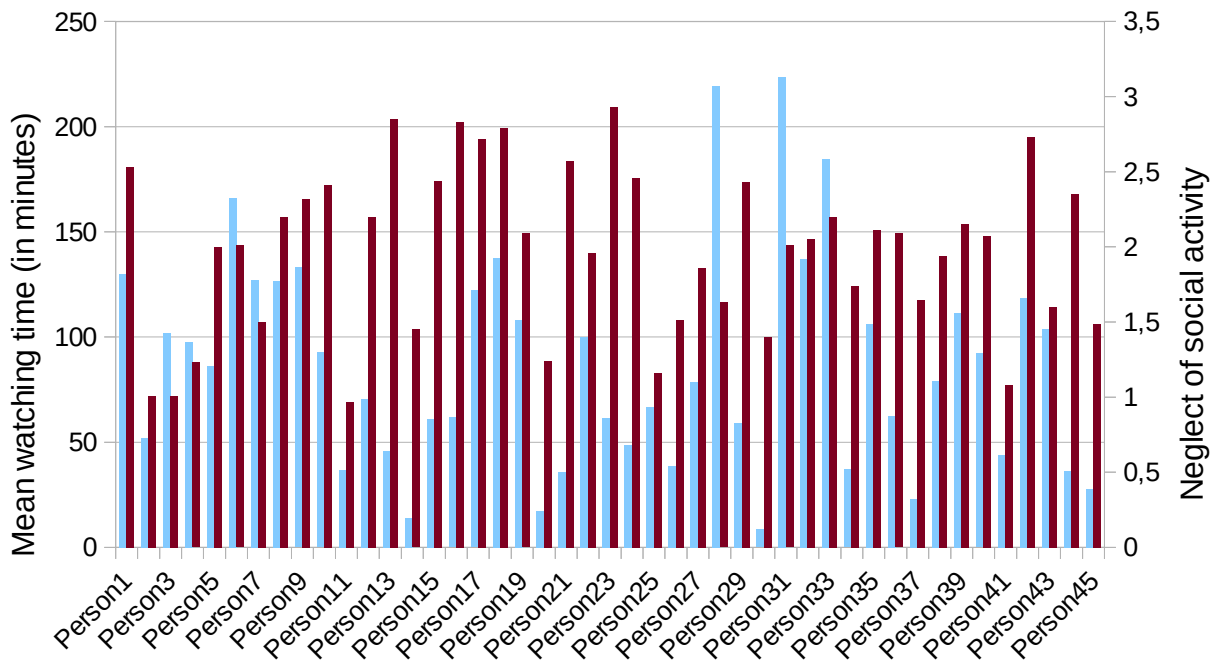


Figure 4. Mean daily watching time (blue) and mean neglect of social activity (red) per participant