THE EFFECTS OF VOD-WATCHING ON FEELINGS OF GUILT AND THE ROLE OF REASONS FOR WATCHING

by

Charlie Shiferaw Chrie

MSc Positive Clinical Psychology and Technology

Supervised by Dr. P. M. Ten Klooster & Sander de Vos, MSc

Charlie Shiferaw Chrie – 1984780

Introduction

Video on demand (VoD) services has superseded traditional ways of watching video content for entertainment. Previous research indicates contradictory results regarding the association between long viewing sessions and mental health variables. The aim of this study was to investigate the temporal association between time spent watching and feelings of guilt between and within participants over time. Reasons for watching (positive vs. negative) was explored as a potential moderator of this association.

Method

This study consisted of a secondary advanced data analysis from a 14-day experience sampling study (ESM). Responses from subjects (N=38) consisted of once-daily assessments of VoD-watching, feelings of guilt and reasons for watching. Several Linear-Mixed Model analyses were conducted to explore the temporal nature of associations, distinguish between-from within-person associations, and the moderating role of reasons for watching.

Results

No significant associations were found between VoD-watching and feelings of guilt as a predictor or outcome (neither at the between- nor within-person level) at the group level over time. No significant moderating effect of reasons for watching was found on the overall association with feelings of guilt as either a predictor or outcome of amount of VoD-watching.

Conclusion

VoD-watching was not associated with guilt over time, neither between nor within persons, nor was it moderated by context. ESM contributed to more in-depth analyses by disaggregating for within and between person analyses and exploring the temporal associations. However, the study was still conducted at the group level. VoD-watching and its' effect on subjects seem to vary from one person to another.

Table of Contents

Introduction

Watching TV shows on demand has provided the general public with much autonomy and freedom (Starosta & Izydorczyk, 2020). The rise of video-on-demand (VoD) services has revolutionised the ways in which media, such as movies and videos, are consumed by users. The transition from watching movies and series on traditional video playback devices, such as DVDs and cassette tapes, to allowing users to take advantage of the technological developments throughout the 21st century has allowed for increased convenience in bringing the media to users. The emergence and adoption of internet technology around the world has allowed for media to be shared with users worldwide and has as such lowered the geographical constraints related to reaching audiences worldwide (Starosta & Izydorczyk, 2020). Popular VoD-services are among others Netflix, Hulu, HBO, Disney+, and Apple TV (Wayne, 2017). These portals have become the primary source to film and TV series by most people. For instance, by 2017, Netflix had approximately 167 million paying subscribers and was available in 190 countries (Wayne, 2017). The availability and possibility of watching videos on demand have also contributed to an increased amount of media being consumed due to the little effort involved in obtaining it, thus, the phenomenon of binge-watching has become apparent in the context of VoD-services (Starosta & Izydorczyk, 2020).

Binge-watching is a relatively new term that has also received increasing interest in research. Definitions of binge-watching vary widely across studies but can generally be defined as watching between two to six episodes in one continual sitting (Starosta & Izydorczyk, 2020). The term *binge-watching* has been criticised for the relatively negative connotation of the term *bingeing* in psychology, while on the contrary it has been praised by users and stimulated by the providers of VoD-services themselves, as seen in the example of Netflix's "binge-worthy series" category (Jenner, 2015). In psychology, the term *bingeing* is usually associated with engaging in indulgent behaviours, such as binge-drinking or binge-eating. It is defined as excessive behaviours that deviates from the norm and is related to negative health aspects, such as feelings of shame or guilt, a lack of control and a lack of regard shown to other activities that would be more productive or meaningful to an individual (Jenner, 2015).

Many of the difficulties faced when researching the predictors and outcomes of binge-watching are associated with the paradoxical nature of the phenomenon itself (Jenner, 2015). Binge-watching is often encouraged and praised as an enjoyable activity, but also considered

an undesirable activity by researchers, because of the negative connotation and the relation to other terms and undesirable behaviours involving the word *binge*. However, research thus far has been unclear in proving a consistent association between binge-watching and mental health variables, showing results that seem to differ depending on several different factors. Among these factors are motivation for watching and duration of time spent watching (Jenner, 2015).

Predictors of VoD and Binge-Watching and Motivation to Engage

Research on the phenomenon of VoD-watching, and binge-watching in specific, has been particularly focused on identifying potential predictors. Among the studied predictors are, first, contextual factors playing a significant role when considering the prevalence of binge-watching among certain populations (Castro, Rigby, Cabral & Nisi, 2019). For instance, practical matters include the need for a stable internet connection, platforms and technologies to watch on and an overall cultural interest in TV-related entertainment. Additionally, factors such as social inclusion and popularity of certain TV shows among groups of people also contribute to binge-watching, particularly among young viewers (Castro, Rigby, Cabral & Nisi, 2019). Motivations to engage in binge-watching have also been examined. Panda and Pandey (2017) explored factors such as social interaction, easier accessibility to relevant content, escape from reality and particularly effective advertisement of content providers (Panda & Pandey, 2017). These were all significant motivators for binge-watchers to engage in compulsive watching and were particularly present among university students. The study also found that among these students, factors such as catching up, relaxing, cultural inclusions and improved viewing experience were significant motivators to further engage in binge-watching as well (Panda & Pandey, 2017).

Outcomes of Binge-Watching

Researchers have presented conflicting results concerning the potential outcomes and consequences of engaging in binge-watching among users (Umesh & Bose, 2019). The potential consequences that have been explored thus far relate to fatigability, lack of high-quality sleep, loneliness, depression, insomnia, mood disturbance and several other psychologically distressing factors (Umesh & Bose, 2019). Additionally, individuals may engage in bingeing to cope with feelings of depression, low self-worth and loneliness, contributing to a cycle of bingeing and maintenance of symptoms (Flayelle et al., 2020).

These factors seem to be supported in some studies, but challenged in others, showing significant positive improvements in mental health variables such as increased feelings of relaxation, and satisfaction (Flayelle et al., 2020). Thus, the need for further advanced research into the relationship between mental health and VoD/binge-watching is needed. Indications about the moderators between these two constructs could potentially explain both why and how binge-watching seems to produce negative effects in one context, and positive effects in another (Umesh & Bose, 2019).

Exploring whether these outcomes are influenced by other contextual or moderating variables is of interest (Flayelle et al., 2020). The reasons for engaging in binge-watching could be similar to the reasons for engaging in other binge-related behaviours. The reasons could be negative, such as escapism from tasks and duties, avoidance and distraction, or positive, such as having time off, relaxing and watching with others in a social context. Additionally, these positive reasons may be functional mechanisms of coping with daily stressors for extended periods of time, before they eventually emerge as negative reasons over time. This is often seen in cases of binge-eating in which individuals wait to seek help until after several years of engaging in these strategies. These reasons could be potential moderators as to why previous research has found differing results (Flayelle et al., 2020).

Recently, a call has been made for further research employing an exploratory and longitudinal research design as it serves some advantages that previous cross-sectional studies lack (Flayelle et al., 2020). Thus, there is a gap in the literature on the outcomes of VoD and binge-watching that calls for further exploration of the temporal association between VoD/binge-watching and feelings of guilt and to explore whether these associations are influenced by either negative or positive reasons to engage in VoD or binge-watching.

Advantages of Experience Sampling Method (ESM)

Researchers studying the effects of VoD and binge-watching have typically utilised retrospective cross-sectional surveys. This design, however, has some disadvantages which can be accounted for by the use of the Experience Sampling Method (ESM). These range between recall errors, biases, inability to consider the contextual factors of participants and being unable to consider changes that happen over time (LaCaille et al., 2013). So far, these shortcomings are noted in the results of a majority of studies with this type of design because they have found differing or contradictory results concerning similar constructs and relationships (Flayelle et al., 2020).

Experience sampling is an intensive longitudinal method of research, that involves collecting information from participants over time (LaCaille et al., 2013). Advantages include the ability to collect responses over time on a repeated basis contributing to increased accuracy in the constructs measured. ESM also allows for the ability to take into account contextual variables that may also change over time, which is particularly important when exploring whether motivations or reasons for engaging in certain behaviours change momentarily (LaCaille et al., 2013). Additionally, the ability to further investigate temporal associations between constructs allows us to gain a better understanding of how the constructs are associated and provide more information about the temporal nature of the associations (Trull & Ebner-Priemer, 2009). The nature of repeated measures improves the reliability, ecological validity and transparency of the assessment patterns of participants (Verhagen, Hasmi, Drukker, van Os, & Delespaul, 2016). Thus, one point of improvement is strongly related to the nature of the construct being measured. Because VoD-watching may happen on a daily basis and fluctuations in both behaviour and mood happen consistently, the repeated measures may be able to more accurately capture information. ESM also allows the ability to distinguish between-person from within-person associations, by taking into account the person-mean and person-mean centred scores of subjects (Curran & Bauer, 2011).

The Association Between VoD/Binge-Watching and Feelings of Guilt and Context

The associations between the amount of time spent watching VoD and binge-watching and mental health outcomes differ across studies, possibly due to other influencing factors. It seems clear that there is a need for further research in contextual and moderating factors that may contribute to the changes in outcome. Also, given the inconsistencies around definitions of binge-watching, it seems important to still consider the absolute amount of time spent watching, and whether that is associated with amount of guilt felt. As with any sort of bingeing behaviour that revolves around indulgence in some activity, there seems to be a corresponding amount of guilt following the activity as explained by Manning (2014). Thus, a possible negative mental health outcome for measurement could be feelings of guilt within participants, following a session of VoD or binge-watching.

Feelings of guilt are often associated with behaviours that constitute a lack of control. Guilt has been associated with repetitiveness in character, as presented by Elvin-Nowak (1999). Also, feelings of guilt arise in situations where an event is interpreted as a failure, loss of control or a disregard for responsibilities (Elvin-Nowak, 1999). Guilt also plays a role

in feelings of depression, particularly when the alleviation of guilt fails. Another study by Bybee, Zigler, Berliner and Merisca (1996) presented results showing a correlation between ineffective alleviations of feelings of guilt, and higher levels of depression. These results indicate that guilt-producing events can be unlikely to induce guilt in individuals, depending on the coping mechanisms used when these events appear (Bybee, Zigler, Berliner & Merisca, 1996).

It seems clear that guilt, and whether individuals feel guilty or not, may be an important variable to consider in research involving VoD and binge-watching. However, only few studies have actually examined the direct associations between guilt and VoD-watching. Researchers, such as Maehra and Gujral (2018), indeed noted that a majority of participants in their study (71.2%) felt increasingly more guilty as VoD-watching time increased. However, these findings did not seem to be associated with whether individuals would be more or less inclined to engage in binge-watching as a result of their associated feelings of guilt with the activity (Mehra and Gujral, 2018).

The aim of the study is to further examine if and how the amount of time spent VoD and binge-watching, depending on the context/reasons for watching, is associated with feelings of guilt over time. The aim is to take into account the momentary changes in contextual factors as captured by the ESM method, here being the reasons for watching, and how this may relate to varying outcomes in feelings of guilt within and between participants. The following research questions were formulated with the primary aim of investigating the association between time spent VoD-watching and feelings of guilt while considering the reasons for VoD-watching. The first research question is "How is VoD-watching associated with feelings of guilt over time?" It is expected that feelings of guilt will increase with time spent binge-watching over time. Also, it will be further explored whether there are differences in the within-person or between-person nature of these associations. Additionally, besides an outcome of watching, guilt will also be considered as a potential predictor of VoD-watching to further explore the temporal nature of associations.

The second research question is "Is this association moderated by momentary reasons for watching?" It is expected that the reasons for watching, either negative or positive, can have a significant influence on the association between VoD-watching and feelings of guilt. Negative reasons in particular are expected to increase feelings of guilt, whereas positive reasons are expected to reduce feelings of guilt.

Methods

This study involved a secondary analysis of the data collected in the ESM study by Lehmkühler (2020) as part of her bachelor's dissertation thesis. Lehmkühler's (2020) study was mainly conducted independently. However, the data collection was conducted with other fellow students with interests in measuring either similar or identical constructs for their own dissertations. The data obtained from this study is suitable for further analysis, as the constructs of interest in this study were investigated and responded to sufficiently through the questionnaires and materials previously used by the researchers. Both daily VoD-watching behaviours and momentary feelings of guilt and context (reasons for watching) were operationalised into items in the assessments that were administered to the participants. Thus, the data obtained can be used for further advanced analysis methods with the purpose of answering the research questions of this study.

The original study was a two-week ESM study performed between April 9th and 22nd in 2020. Ethical approval was obtained (200366), by the University of Twente Ethics Committee. The goal of this secondary study is to further investigate the possible associations between the constructs of interest, being the association between VoD-watching, binge-watching and feelings of guilt, with the addition of reasons for watching as a third moderating variable.

Design and Materials

Daily measurements were recorded over 14 days. Materials were comprised of (a) a one-time demographics assessment, (b) a daily behaviour assessment and (c) a twice-daily state assessment. These questionnaires were all administered through the "Ethica" mobile application on the smartphones of participants (Ethica, 2021). The researchers responsible for the collection of data were interested in both similar and different constructs of measurement, and as such, only the data relevant to this study will be used for further analysis. The questionnaires used to measure the constructs were administered at random time points within predetermined timeslots that were repeatedly presented to the participants on a momentary basis. This type of interval-contingent sampling, which is also called signal-contingent sampling, ensured that assessments were triggered at unpredictable times between a set time interval (Trull and Ebner-Priemer, 2009). The study adhered to the general guidelines set by extensive research into previous ESM studies as presented in the paper by

Conner and Lehman (2012). The number of 14 days of measurement was considered sufficient for recording efficient and reliable data with the least burden to participants (Connor & Lehman, 2012). The number of signals presented to participants should be less than 10 and more than four, ideally around six signals daily to minimise participant burden and still capture sufficient data. The original study, however, presented participants with only three signals daily, twice for state assessments and once for behavioural assessment. This was primarily done to limit the burden on participants.

The time of the behavioural measurements, that assessed the VoD-watching behaviours of the previous day, was randomly assigned between 10:00 a.m. and 10:30 a.m. and presented to participants. The measurement remained available for the following 10 hours to avoid memory bias and to allow participants to thoroughly consider their watching behaviour at their preferred time before responding. This contributed to lessening the pressure/burden to their daily schedules. Lastly, to avoid missing responses, an additional notification was released 1.5 hours after the 10 hours to notify participants to respond.

Figure 1
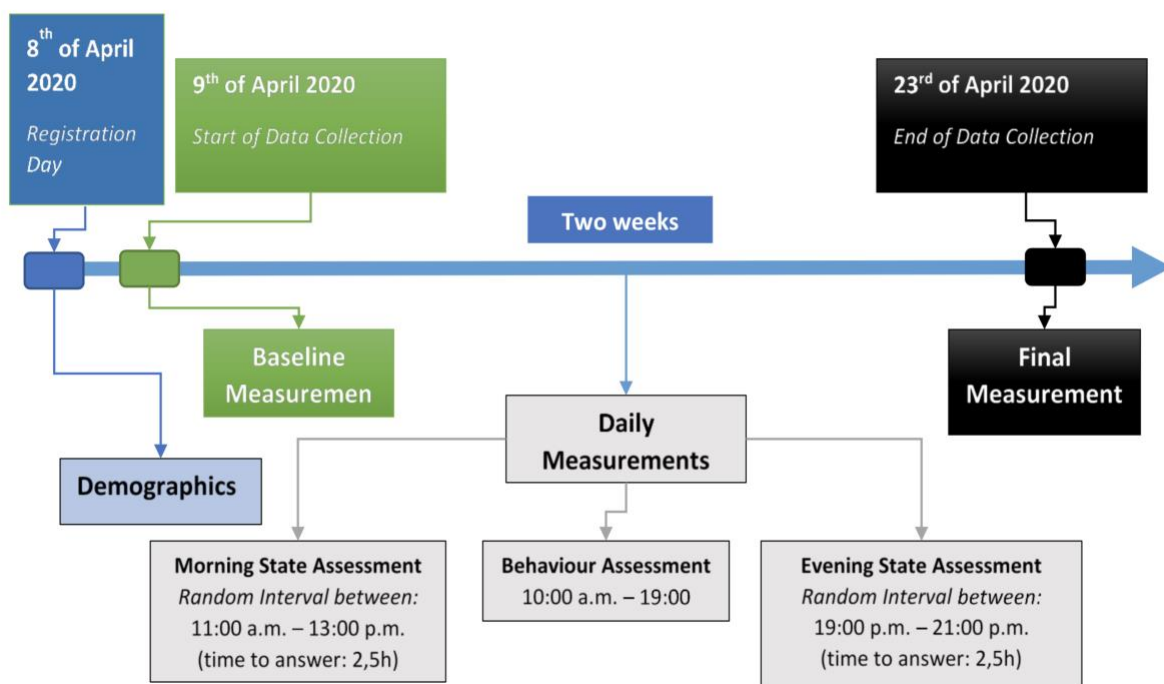
Note. Graphical representation of the design and its components seen holistically.

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Behaviour and Subjective Well-Being. (Unpublished bachelor dissertation). University of Twente. Copyright 2020 by Dino Erker.

Procedure and Measurement

Respondents were recruited through social media and mobile texting applications, such as Facebook, WhatsApp and Instagram. First, respondents were asked to fill out an informed consent prior to beginning the data collection, which was followed by a baseline and demographics measurement. Following these tasks, the data collection started the next day with a daily behaviour assessment of VoD-watching the previous day. This included questions about all the constructs to be measured within this study. The amount of time spent VoD-watching, reasons for watching, as well as state assessments (including feelings of guilt) after watching were all measured in this daily assessment. Participants were asked to fill out the assessments if they had engaged in VoD-watching.

The state assessments were administered twice each day, once in the morning between 11 a.m. and 1 p.m., and once in the evening between 7 p.m. and 9 p.m. The purpose of this assessment was to capture several momentary symptoms of depression within individuals, including feelings of guilt, which were sampled using questions based on the diagnostic criteria presented in the DSM-5 manual (American Psychiatric Association, 2013). These state assessments were administered to gain insight into the possible negative mental health consequences associated with reasons for engaging in binge-watching. See Figure 2 for the allocation of measurements and assessments in the given time schedules.

Figure 2
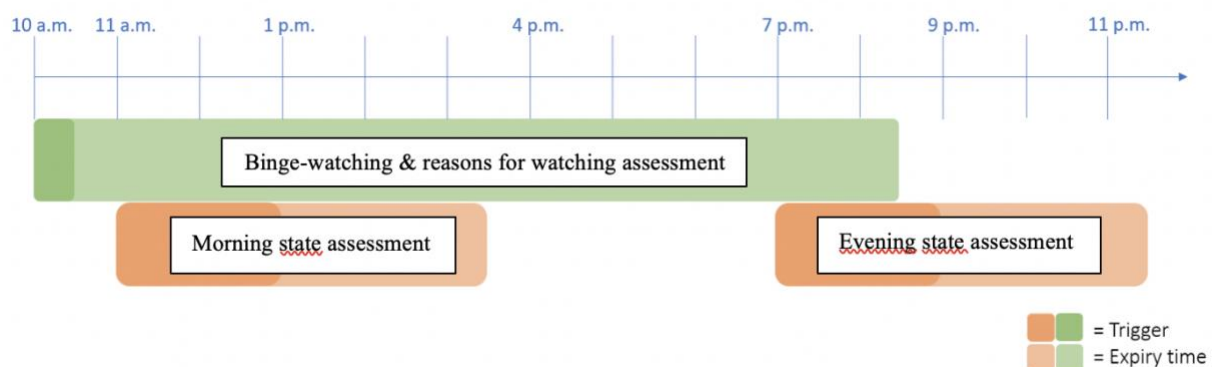
Note. Graphical presentation of the time frames of measurements, of both the behaviour and state assessments measuring feelings of guilt, and related mental health variables from 9th of April, to the 22nd of April 2020.

VoD-watching Behaviour and Reasons for Watching

Amount of VoD-watching was measured in hours, offering participants the option to add hours of watching in 0.25-unit intervals. This enabled participants to add quarters of an hour of watching time together to fit their total sum of watching, as to prevent having to round up to full hours for more precise measurements. Additionally, binge-watching was measured by asking "Did you watch for more than 1 hour?" with possibilities to answer "yes" or "no", and whether they watched more than two episodes the previous day. Additionally, participants were asked to indicate how many episodes they watched. If they watched more than 20 episodes, they were asked to choose to choose 21. The number of episodes was measured by allowing participants to add 0.5 intervals of an episode, to sum up their total amount of episodes, up to 21.

Furthermore, reasons for watching were assessed in the behaviour assessment using a multiple-choice item with nine predefined reasons. For the purposes of this research, reasons for VoD-watching were recoded into two categories being "negative reasons" and "positive reasons." Negative reasons for watching were boredom/nothing else to do, stress, escape from reality/distraction and procrastination/avoidance (Starosta et al., 2019; Flayelle et al., 2020). Positive reasons were entertainment, interest/curiosity, information seeking, peer activity and relaxation/taking a break (Kubey & Csikszentmihalyi, 1990). For the moderation analysis, the reasons for watching were dummy coded into a new variable. Participants could select multiple reasons. If one was negative, this variable was automatically dummy coded as 1 (negative reason). This was done to account for the low rate of overall negative reasons and to have more data available to do the analyses.

Daily State Feelings of Guilt

The state assessments included the item "feelings of guilt" which was used for the daily measurement of feelings of guilt. In order to get one guilt measurement per day, the mean of the guilt item in the two daily state measurements was computed and used per

participant. Participants could indicate whether they felt guilty or not by answering "yes" or "no." If "yes" was chosen, then the answer possibilities would range between "not at all," "slightly," "moderately," "strongly" and "extremely" (Flayelle et al., 2020).

Participants

In total, 42 participants were recruited for the ESM study. Three participants were excluded from the dataset due to a large number of missing responses or expired questionnaires. The responses from the aforementioned participants were below 40% of administered assessments which, according to Connor and Lehman (2012), should be excluded due to excessive measurement error. Therefore, a total of 38 participants aged between 18 and 51 years of age were included for analysis in the current study. The required number of participants was determined according to the guidelines presented by Connor and Lehman (2012) and corresponds with the size, design and method of research conducted in this study. No specific guidelines considering the number of participants is set because they depend on the occurrence of the phenomena to be measured (Connor & Lehman, 2012). If the occurrence happens often, then fewer participants are generally needed to generalise the observations to the general population of experiences (Connor & Lehman, 2012). Participants consisted of 38 subjects comprised of 21 males and 17 females aged between 18 and 51 years old. They had a mean age of 23.7 years (SD = 5.3) and were largely of German nationality. A total of 87% of the participants used Netflix as their primary source of VoD-watching.

Data Analysis

First, the collected data were transformed into a workable dataset through the use of SPSS Version 24, an IBM Statistics Program for Social Sciences. The data were analysed using a series of linear mixed models (LMMs). A LMM is suitable for exploring the associations of the chosen constructs in the context of (intensive) repeated measures over time (Verhagen, Hasmi, Drukker, van Os & Delespaul, 2016). LMM allows for imperfections in the collection of the repeated measures such as missing values, while also allowing for the nesting of data within individuals over time. LMM removes any time-confounding effects by adding a time variable which is seen in the repeated measurements taken. In all LMMs, the associations between the repeated measurements were modelled with a first-order autoregressive covariance matrix (AR1). AR1 assumes that correlations decrease and that variances are stable over time. This accounts for nesting within participants resulting in autocorrelation between responses within the same subject. Second, when participants are assessed more intensively there is a higher risk of missing responses leading to higher case-wise deviation, leading to exclusion in non-ESM designs. In LMM, the missing data points will be accounted for within the model, and an appropriate response is generated when data may be missing. However, measurement error increases with the amount of missing data and should be monitored. (Verhagen, Hasmi, Drukker, van Os, & Delespaul, 2016).

For the specific analyses in this study, the parameter estimates for associations, and marginal means on the variables of interest were estimated for each time point. For all associations, only unstandardised estimates were used (*B*). Additionally, a number of figures were computed to get a further overview of the findings and to check whether any preliminary associations could be drawn between variables.

In all LMMs, the individual participants were entered as subjects, with the time points (day, 0–14) of measurements as the repeated measures in all models. The average feelings of guilt on the measurement points (i.e., in the morning and in the evening the day after the VoD-watching behaviour) were the dependent variable in the first set of analyses. The mean number of hours watched was set as the time-varying fixed effect (covariate) in a first model to obtain the overall association between amount of VoD-watching, binge-watching (yes/no) and feelings of guilt the next day over time.

To disaggregate between-person and within-person associations the person-mean score of VoD-watching was computed first, presenting the summary of VoD-hours watched

within each subject (Curran & Bauer, 2011). This would allow us to explore whether there are any significant associations to be found across subjects when comparing their means to each other cross-sectionally. Next, the person-mean centred score was computed by subtracting the respective person-mean score for each subject, from the reported values of that subject's VoD hours watched. This would allow to explore whether an association was found within the subjects' own measurements when comparing them to their own scores and the deviation between these individual scores from the mean of their scores. The LMM model was run with average feelings of guilt as the dependent variable, and both the PM and PMC scores were added as time-varying fixed covariates effects (Curran & Bauer, 2011).

To examine the potential moderating role of reasons for watching in the overall association between VoD-watching and feelings of guilt, both the time-varying fixed VoD hours variable and the dummy-coded reasons for watching and their interaction term were set as the covariates prior to running the model. The mean scores of feelings of guilt the next day were set as the dependent variable. A significant interaction term would indicate that reasons for watching moderates the relationship between VoD-watching and feelings of guilt.

The next set of analyses involved using lagged effects to further make use of the temporal advantage of ESM studies. Instead of measuring the association between VoD-watching and feelings of guilt on the next day, the goal was now to measure the association between VoD-watching and feelings of guilt on the same day. Reasons for watching were, again, considered to be a potential moderator in the last analysis to explore whether reasons for watching have an influence on the relationship between feelings of guilt and its association with amount of VoD-watching the same day.

In these last analyses, feelings of guilt were considered to be the predictor variable, and the lagged VoD hours watched as the outcome variable. To move the observations of VoD hours watched forward by one timepoint, a new lagged variable was created to lag the variable by one score for all observations. The result was having the hours watched as being measured at the same day as feelings of guilt. The first observation for all subjects was filtered out in the dataset, to prevent assigning the last score of the previous subject, as the first score of the next subject. Last, the same LMM as in the first moderation analyses was conducted, but now with the lagged VoD hours as dependent variable, and mean feelings of guilt and reasons for watching as an interaction term to test for moderation.

Results

VoD-Watching, Binge-Watching and Feelings of Guilt Over Time

In 297 of the 516 available daily assessments (57.6%), participants indicated that they had engaged in VoD-watching the previous day. 58% of the 297 respondents reported having watched a series. In total, the mean numbers of hours watched among the 297 responses amounted to 2.29 hours daily. The mean number of episodes of the 297 respondents amounted to 3.6 episodes watched daily.

In 71.4 % of these 297 survey responses, participants indicated to have (binge)-watched for more than one hour, or more than two episodes the previous day.

The mean feelings of guilt among the 297 responses indicating to have engaged in VoD-watching across all time points was low at 1.35 (see Figure 3).

Table 2

Overview of responses

VoD-watching	Series	Binge-watching
297 of 516 (57.6%)	172 of 297 (58%)	212 of 297 (71.4%)

VoD-Watching, Binge-Watching and Feelings of Guilt

To explore potential associations of VoD-watching behaviour and binge-watching behaviour with feelings of guilt over time and across participants the data was first visualised in several plots. The average of hours watched among participants, and their average level of feelings of guilt was visualised first. The plot shows no clear indication of an association between the mean VoD hours watched, and the mean feelings of guilt over the 14 days of measurement (see Figure 3).

Figure 3

Mean hours watched and mean levels of feelings of guilt over time for all subjects
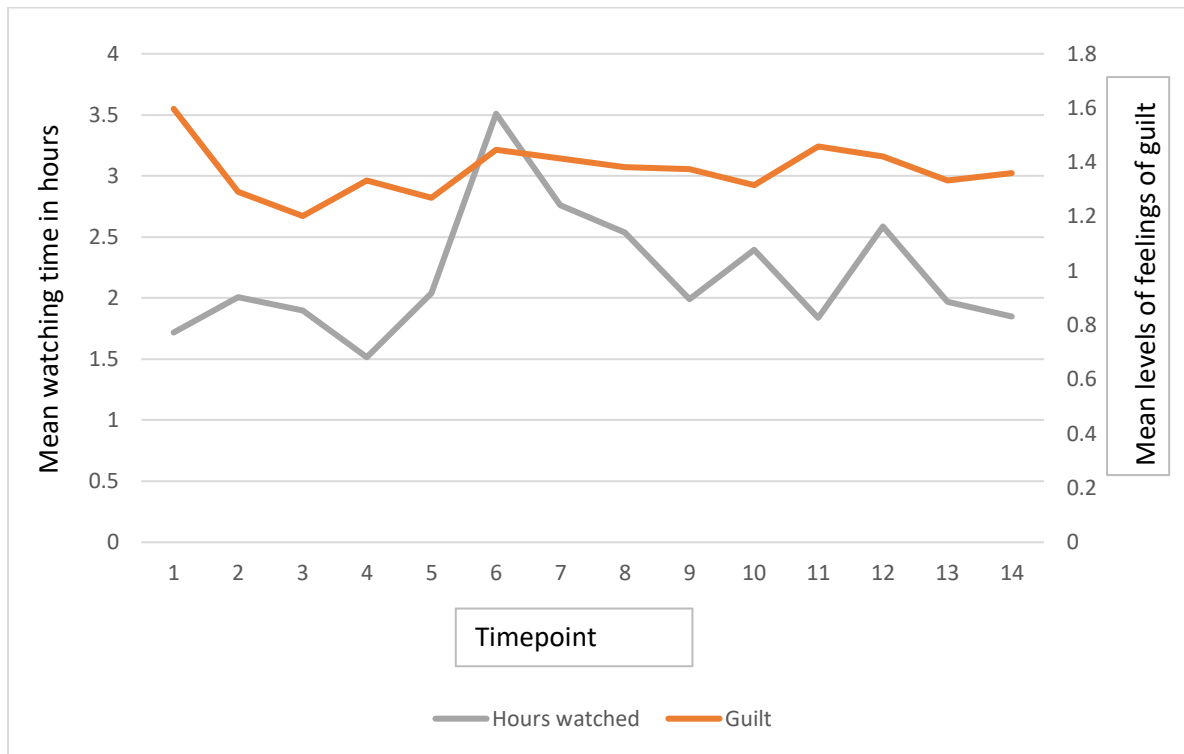
To further explore whether there was an association between subjects' individual watching behaviour and feelings of guilt, a second visualisation was computed. The figure shows no clear association between amount of VoD-watching and feelings of guilt (see Figure 4).

Figure 4

Mean feelings of guilt and mean hours watched daily of each subject
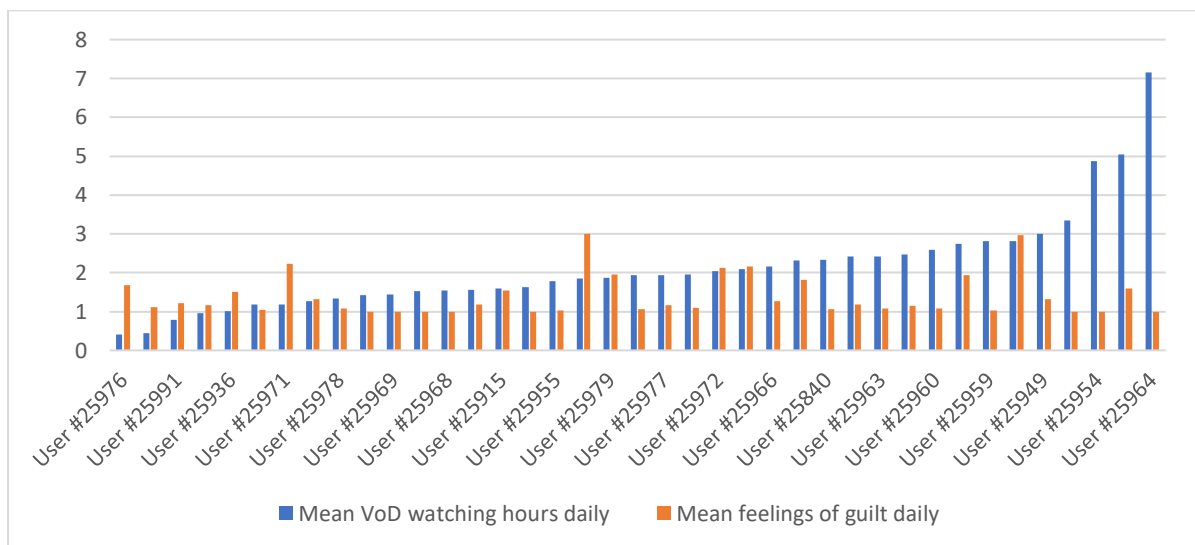
Overall Association Between VoD-Watching and Guilt

Next, LMM analysis was conducted to statistically test the effects of VoD-watching on mean feelings of guilt. No significant overall linear association was found between the hours watched and mean feelings of guilt the next day at the group level ($B = 0.001$, $SE = 0.02$, $p = .95$). To test the effects of binge-watching behaviour (more than one hour or two episodes in one continual sitting) and the association with mean feelings of guilt, a second LMM analysis also found no significant association between whether participants binge-watched or not and the mean feelings of guilt ($B = -0.056$, $SE = 0.07$, $p = .49$).

Disaggregation of Between-Person and Within-Person Associations

To test whether an association between guilt and number of hours watched was present at either the between-person or within-person level, two LMMs was conducted using the individual mean watching time of each subject, and the deviation from this mean across each time point within subjects as fixed covariates. Both the person-mean scores and person-mean centred scores were not significantly associated with guilt the next day, ultimately showing no significant association either between or within people, and the association with hours watched and feelings of guilt. The person-mean presented a value of ($p = .84$) and an estimate of $B = 0.013$ ($SE = 0.05$). The person-mean centred score presented a value of ($p = .99$) with an estimate of ($B = 0.001$, $SE = 0.02$) reflecting the absence of both within- and between-person associations. The scores were kept unstandardised as no significant effect was found (Curran & Bauer, 2011).

VoD-Watching, Reasons for Watching and Feelings of Guilt

The last research question aimed to explore whether reasons for watching could have a significant effect on the relationship between VoD-watching and feelings of guilt. LMM analysis was conducted to test whether there was a significant interaction effect present between reasons for watching and amount of VoD-watching on feelings of guilt. The parameter estimates showed no significant interaction effect between reasons for watching or number of hours watched on feelings of guilt with a regression estimate of ($B = -0.098$) ($SE = 0.03$; $p = .73$). No significant two-way interaction was found between the VoD hours watched

and reasons for VoD-watching on the dependent variable—feelings of guilt—as indicated by the interception plot (see Figure 5).

Figure 5

Two-way linear interaction plot
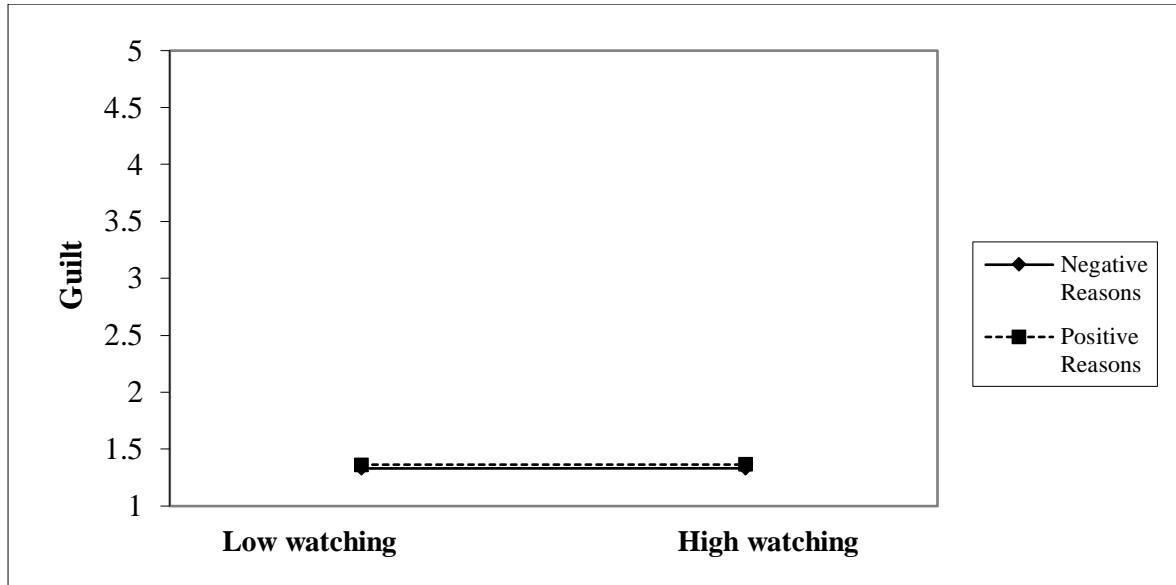
Feelings of Guilt as a Predictor of VoD-watching (Lagged Analysis)

The following analysis aimed to test the mean feelings of guilt as a predictor of VoD hours watched. LMM analysis was conducted with the lagged VoD hours watched as the dependent variable, and mean feelings of guilt as the covariate. No significant linear association was found between the mean feelings of guilt and VoD hours watched on the same day at the group level ($B = 0.012$, $SE = 0.04$, $p = .45$).

Feelings of Guilt as Predictor, Reasons for Watching and VoD-Watching

Last, LMM analysis was conducted to test whether there was a significant interaction effect present between reasons for watching and mean feelings of guilt on VoD hours watched the same day. The parameter estimates showed no significant interaction effect between reasons for watching and mean feelings of guilt on VoD hours watched the same day with a regression estimate of ($B = 0.269$) ($SE = 0.06$; $p = .61$). Thus, no significant two-way interaction was found between mean feelings of guilt and reasons for watching VoD content on the lagged VoD hours watched.

Discussion

The aim of this study was to further explore the topic of VoD and binge-watching and its association with feelings of guilt over time. The analyses showed that no significant associations could be found at the group level between amount of VoD-/binge-watching and feelings of guilt the next day. Disaggregated between- versus within-person analysis also showed no significant association between amount of VoD-/binge-watching and feelings of guilt the next day at either level. The temporal direction of the relationship at the group level was also explored with feelings of guilt as a potential predictor of VoD-watching the same day. Again, no statistically significant association was discovered. Two moderation analyses showed that positive versus negative reasons for watching did not moderate the association between VoD-watching and feelings of guilt the next day, nor feelings of guilt the same day of watching.

Overall Association Between VoD-Watching and Feelings of Guilt

The association between amount of VoD-watching and feelings of guilt was not significant against the expectation that feelings of guilt would increase with amount of time spent binge-watching over time within subjects. This expectation was based on the observation that behaviours involving bingeing and excessive engagement that is outside the control of individuals is often associated with increased feelings of guilt (Jenner, 2015). However, this outcome relates more to the findings of Flayelle et al. (2020), stating that differences among individuals may be present concerning their watching behaviour and its' relation to mood and mental health. Group level research and analysis may be oversimplifying the differences present among individuals (Flayelle et al., 2020). To further investigate whether VoD-watching is related to mental health variables on a personal level, more detailed studies may need to be conducted at the individual level. This relates to the finding by Bybee, Zigler, Berliner and Merisca (1996) that the negative effects of bingeing behaviour may be related to the extent that it is used as a coping mechanism. As a result, single-case studies and N-of-1 analyses could be of more relevance than group-level designs if the aim is to provide clinically relevant insights (McDonald et al., 2020).

The outcomes of some individuals using VoD-watching as a coping response may not necessarily be negative or in the form of increased guilt (Flayelle et al., 2020). This leads to another finding in the study by Flayelle et al. (2020), that research into this topic may have

been over pathologizing the outcomes of VoD-watching. VoD-watching is often a form of entertainment, and there may be limited evidence to support that it will frequently lead to negative outcomes and should possibly be approached in a less biased manner than researchers have done so far (Flayelle et al., 2020). This is not to dispute the idea that excessive VoD-watching is healthy or free of complaints from everyone. The possibility that VoD-watching is linked to pathological behaviour in some subjects remains plausible.

Guilt as a Predictor of VoD-Watching (Lagged Analysis)

There is a lack of research on the direct association between guilt and VoD-watching, and as such the direction of the relationship could also be explored further. The choice to focus on guilt as a primary construct in the current study was motivated by studies such as the one by Maehra and Gujral (2018), showing that feelings of guilt, and VoD-watching present a significant association. This seemed particularly interesting to explore in a study employing the ESM study design, with its clear benefits in measuring associations over time. As previously noted, the research available on the topic is limited, especially with respect to VoD-watching as a direct outcome of increased feelings of guilt, or vice versa, guilt as an outcome of increased VoD-watching. Therefore, the expectations for the assumed associations were based on limited evidence available from earlier research.

In an attempt to fully utilise the strengths of the ESM design, a temporal, lagged analysis was performed with guilt as a predictor of VoD-watching on the same day. Again, no significant findings were found against the a-priori assumption that subjects would feel more inclined to engage in increased VoD-watching the more guilty they felt prior to watching. Here, it is important to consider that guilt is a very specific construct where research is still lacking, especially when it is compared to other more well-researched mental health variables in the field of psychology, such as depression, or basic emotions, such as feelings of sadness. Manning (2014) showed that guilt is often the consequence of indulgence in some behaviour or activity. If the indulgence is accompanied by a lack of self-control and a disregard for responsibilities, then the person's feelings of guilt will further increase (Manning, 2014). However, the research on guilt as a predictor of indulgent behaviours, particularly in relation to VoD-watching, is limited (Elvin-Nowak, 1999).

Disaggregation of Between-Person and Within-Person Associations

A further attempt to look into the associations between VoD-watching and guilt was made through exploring both within- and between-person differences in the analyses. Psychologists realise that changes and associations within individuals are important to consider, as data regarding their own measurements and the comparisons to their own baseline measures present the most value to exploring the nature of their own individual complaints (Curran & Bauer, 2011).

Previous studies have mainly employed the cross-sectional study design and measured the overall differences between people in studies of VoD-watching and its association with mental health variables (LaCaille et al., 2013). However, the differences and associations between people may be of little interest to psychologists, particularly when the primary aim is to improve the lives of individuals. The ESM design of the current study allowed for the disaggregation of between-person and within-person associations, to see whether there was a change or association to be observed within the individuals own measurements over time.

The analyses showed no significant association at either the within- or between-person level. The expectation presented earlier, that feelings of guilt increase with VoD-watching over time, was again rejected when considering the associations at the within-person level. Research at the individual level is lacking, and more intensive data-collection could possibly provide more insight than what was presented here (Curran & Bauer, 2011).

Reasons for Watching and its' Association with Feelings of Guilt

The use of the ESM allowed for further research to be deployed to fill some of the gaps in the current research available. One gap, in particular, was related to the contradictory results provided by earlier studies deploying a cross-sectional study design. Some researchers found increased amounts of VoD-watching to be associated with positive outcomes in guilt and overall mental health while other cases were associated with negative outcomes (Umesh & Bose, 2019).

Umesh and Bose (2019) specifically called for further research into this topic, as no clear associations were found due to contradictory results. The current study considered the potential moderating role of contextual factors, in this case, as the specific reasons for watching. A study by Panda and Pandey (2017) highlighted the importance of motivations for watching as a predictor of whether participants would engage in binge-watching or not. Based on this previous research, feelings of guilt associated with VoD-watching were expected to be further influenced by the reasons for watching, either for the better or for the

worse. Yet, reason for watching did not have a significant moderating effect on the relationship between VoD-watching and feelings of guilt.

Next, a lagged analysis was conducted with feelings of guilt as the predicting variable, VoD hours watched as the dependent variable and reasons for watching as a moderator. Again, the reasons for watching did not present any significant moderation on the relationship between guilt and VoD-watching. The lack of any significant moderation may call for a further exploration into which mental health variables and contextual variables to effectively include in future research. Mental health variables to consider including could be dependent/predictor or moderating variables where research is already more well-saturated.

Strengths

The unique nature of ESM data allowed for the constructs to be explored interchangeably, hereby considering the temporal aspects of associations as referred to by Trull and Ebner-Priemer (2009). As seen in the lagged analyses, it was possible to use the existing data to interchangeably shift the roles of the constructs between being a predictor or an outcome variable. Also, it allowed for contextual effects to be taken into account.

In general, the ESM method aids in the overall reliability of measurements due to the intensive nature of repeated measurements (Trull & Ebner-Priemer, 2009). Even though the repeated measurements were not highly intensive in this study, equalling one measurement daily, they still included more momentary measurements when compared to cross-sectional study designs. More measurements lead to less recall bias and provide more detailed information about momentary states (Trull & Ebner-Priemer, 2009).

The reduction of recall bias in ESM studies, when compared to cross-sectional studies, can provide results of higher reliability and validity. Validity of the behavioural assessment could be inferred from the coherence between the reported time spent VoD-watching, and number of episodes watched. Thus, participants can be assumed to have filled out the questionnaires correctly, with conscious effort.

Another strength is related to the exploratory nature of ESM designs. The current study focused on exploring two primary research questions and allowed for further creativity, and different analyses to be conducted with the longitudinally obtained data. Rather than testing for particular hypotheses (even though expectations were formed) the purpose became to expand our knowledge on the topic of the chosen constructs that ESM contributed to.

Limitations and Practical Implications

The aim of this study was to provide further insight and exploration into the topic of VoD-watching and how it may relate to feelings of guilt in individuals. The data and method allowed for many analysis options. However, the researcher had to stick with the design options initially chosen by the primary researchers, of which this secondary data analysis was used (Lehmkühler, 2020).

The lagged analyses were achieved with the help of the longitudinal data, however, an assumption had to be made with regard to changing the variables so that guilt became the predictor and amount of VoD-watching became the dependent variable. It was assumed that the state-guilt assessments were completed before the subjects had engaged in VoD-watching for the day. It is, of course, highly unlikely to conclude that this was actually the case for all participants at every assessment. However, without these assumptions in mind, the possibility of exploring the previously collected data further without any additional intervention in data collection would be rather limited.

Another limitation is that the data was collected during the Covid-19 pandemic. Subjects were mainly students who were all asked to stay at home and study on time schedules that were relatively less constricting and demanding than usual. The decreased feelings of obligations as described by Granow et al. (2018), may have led to poor generalizability of the results when comparing it to the usual everyday conditions of students and the lack of a pandemic. Feelings of guilt may also have been observed differently than if the data collected from subjects involved their usual amount of obligation. Absent these temporary circumstances, the amount of VoD-watching may also be expected to be lower. Additionally, with the increasing amounts of watching, feelings of guilt could potentially be higher due to the increased risk of neglecting daily responsibilities (Granow et al., 2018).

Another limitation relates to the lack of intensive data in the disaggregated within- and between-person analyses (McDonald et al., 2020). Although data were collected for 14 days, the data was quite limited compared to that of dedicated longitudinal and intensive N-of-1 studies. The analyses included one guilt measurement per time point, leading to a total of 14 observations per subject over 14 days. This may, in most cases, not be considered intensively collected data. The lack of intensively collected data did not allow to truly disaggregate and analyse subjects at the individual level (McDonald et al., 2020).

A limitation may also be found in the difference among subjects' individual significant (or nonsignificant) associations (McDonald et al., 2020). This difference is not taken into account as the analyses were done at the group level. All subjects were considered as part of the same dataset and expected to fit the same overall regression line. This may lead to inconsistencies among the outcomes of each subject and result in an overall analysis with no significant outcome at the group level (McDonald et al., 2020).

Another limitation relates to the pre-selected answering options for reasons for VoD-watching. For instance, in the case of the findings from Bybee, Zigler, Berliner and Merisca (1996), the options to report the extent to which VoD-watching is used as a coping mechanism could be interesting to include. If the purpose is to conduct clinically relevant N-of-1 studies, then the subjects' reasons for VoD-watching could even be left completely open for the respondent to report, instead of having to choose between the preselected answering options. This could minimise bias and increase validity (McDonald et al., 2020).

Future Research and Recommendations

This study aimed to contribute to the current lack of research in the field of VoD-watching and outcomes in mental health variables, guilt in particular in this case. The lack of significant findings at the group level between VoD-watching and feelings of guilt may further indicate that no actual association may be present. Again, researchers should be careful and aware not to potentially overpathologise the consequences of VoD-watching as it seems that current research is slightly biased towards expecting some significant association between negative mental health variables and longer sessions of VoD-watching (Flayelle et al., 2020). With the use of ESM as an in-depth tool of analysis, the findings may further indicate that other variables may be important to consider if the purpose of the research is to find clear associations between VoD-watching and other potentially influencing or associated psychological factors. This study was done as an advanced analysis of a previous study conducted by Lehmkühler (2020), and as such, the data collected was re-used for further exploration. As a result, the constructs of guilt and the options for reasons for watching have been explored thoroughly, with little to no significant findings of major importance. Thus, it may be of further interest for other researchers to conduct research with new data, different constructs or maybe even different goals in mind regarding potentially expected outcomes.

Researchers are also encouraged to further explore the effects of VoD-watching on mental health variables over a different selection of time points, or in long-term studies. For

instance, it would be interesting to see whether high amounts of VoD-watching are associated with increased risks of developing certain mental health disorders in the long-term. However, the constructs of interest, to be analysed with respect to VoD-watching should be carefully considered. Researchers should focus on constructs that have already been well-researched if they are determined to present findings that are significant. Psychological variables related to those commonly referred to in clinical practice, such as depression, anxiety and such could be of interest to explore in relation to VoD and binge-watching. In this case, if there were any significant associations present, then these findings could also be applicable to the field of clinical psychology. This is because the clinical field is mainly focused on diminishing mental health complaints or minimising the risk of developing these complaints in patients.

Conclusion

The aim of this study was to provide further insight into VoD-watching, a topic that is in its' early days of exploration. To this end, two research questions were explored through the use of the longitudinal ESM design. The general association between amount of VoD-watching, binge-watching and feelings of guilt were explored through five LMM analyses. The first two consisted of exploring the overall association between binge and VoD-watching with guilt as the outcome variable. The next two consisted of the disaggregation of between-person and within-person associations with VoD-watching as a predictor and guilt as an outcome. The fifth analysis consisted of a lagged LMM with guilt as a predictor and amount of VoD-watching as an outcome. No significant associations between VoD-watching and feelings of guilt were found in any of the five models.

Additionally, two moderation analyses were conducted. The first consisted of VoD-watching and reasons for watching as an interaction term on the association between VoD-watching as a predictor and feelings of guilt as an outcome. The second analysis consisted of a lagged LMM with guilt and reasons for watching as an interaction term on the association between guilt as a predictor and amount of VoD-watching as an outcome. No significant moderation effect was found in both analyses. Overall, the findings suggest that amount of VoD-watching is not associated with feelings of guilt at a group level. The current study adds to the current inconsistencies in the research of VoD-watching and its association with psychological variables. A call is made for further research into specific single-case studies with an ESM design because personal changes and differences among participants are important to consider when studying the predictors and outcomes of VoD-watching.

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