'Are you still watching?' – A study on the predictors of the problematic practice of binge-watching

'Você ainda está assistindo?' – Um estudo sobre os preditores da prática problemática de binge-watching

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Abstract: By implementing innovative ways of accessing the media, video-on-demand services have renewed the concept of watching television, leading to the growth and popularity of social behavior of content consumption in the form of marathons, known as binge-watching. There is an increase in literature discussions about potential adverse outcomes that can arise from the excess of these marathons. It is because the adversities of its excessive use can affect its users in the social, physical, and mental spheres. Given the relevance of this social problem, this research aims to understand the main determining predictors of the problematic practice of binge-watching. The research sample consisted of binge-watching practitioners (n=467). The linear and multivariate

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methods used Structural Equation Modeling by Partial Least Squares (SEM-PLS) and Necessary Condition Analysis (NCA). As a result, the study showed that the practice, associated with the psychological predisposition of individuals, can lead to the development of negative symptoms similar to addiction to various technologies, compromising the individual's life both physically and psychologically. This phenomenon intensified during the COVID-19 pandemic when binge-watching was used for distractions, entertainment, and the management of negative sensations arising from the pandemic. Finally, this research contributes to the proposition of an original theoretical model on the problematic practice of binge-watching. It brings elements to reflect from the Environmental, Social and Governance (ESG) point of view, as companies must commit to their social governance, thinking of strategies to optimize the obtaining profits, in the present study, subscriptions, without compromising the health of individuals.

Keywords – Binge-watching; Problematic practice; Streaming service.

Resumo: Ao implementar maneiras inovadoras de acessar a mídia, os serviços de vídeo sob demanda renovaram o conceito de assistir televisão, levando ao crescimento e popularidade do comportamento social de consumo de conteúdo em forma de maratonas, conhecido como *Binge-Watching*. Há um aumento nas discussões na literatura sobre os potenciais resultados adversos que podem surgir do excesso dessas maratonas. Isso ocorre porque as adversidades do uso excessivo podem afetar seus usuários nas esferas social, física e mental. Dada a relevância deste problema social, esta pesquisa visa entender os principais preditores determinantes da prática problemática de *Binge-Watching*. A amostra da pesquisa consistiu em praticantes de *Binge-Watching* (n=467). Os métodos lineares e multivariados utilizados foram a Modelagem de Equações Estruturais por Mínimos Quadrados Parciais (SEM-PLS) e a Análise de Condição Necessária (NCA). Como resultado, o estudo mostrou que a prática, associada à predisposição psicológica dos indivíduos, pode levar ao desenvolvimento de sintomas negativos semelhantes à dependência de várias tecnologias, comprometendo a vida do indivíduo tanto física quanto psicologicamente. Este fenômeno se intensificou durante a pandemia da COVID-19, quando o *Binge-Watching* foi usado para distrações, entretenimento e gestão de sensações negativas decorrentes da pandemia. Finalmente, esta pesquisa contribui para a proposição de um modelo teórico original sobre a prática problemática de *Binge-Watching*. Traz elementos para refletir do ponto de vista Ambiental, Social e de Governança (ESG), pois as empresas devem se comprometer com sua governança social, pensando em estratégias para otimizar a obtenção de lucros, no presente estudo, assinaturas, sem comprometer a saúde dos indivíduos.

Palavras-chave – *Binge-watching*; Prática problemática; Serviço de streaming.

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Introduction

The explosion of disruptive technologies in the last decade has obsolete previously established technologies, changing the criteria and metrics of competition between companies in a particular segment (Noh, 2021). These technologies have brought a new face to the consumption of series, giving space to streaming services on demand, characterized by providing services to consumers through a data connection without the need for physical storage of the product (Hiller & Walter, 2015).

By implementing innovative ways of accessing the media, video-on-demand services have renewed the concept of watching television (Boca, 2019), leading to the growth and popularity of social behavior of content consumption in the form of marathons, known as binge-watching (Flayelle et al., 2020; Song et al., 2022).

The popularity of TV services distributed over the Internet, such as Netflix, Amazon Video, and Disney Plus, along with the production of more elaborate stories, contributed to the popularization of binge-watching. The motivation for consuming series through this strategy is the viewers' feeling that it increases the realism of a show, bringing them closer to its worlds, characters, and plots (Pittman & Steiner, 2019).

In this sense, there is a growth in the popularity of binge-watching and discussions about potential adverse outcomes that can arise from the excess of these series marathons (Flayelle et al., 2019b). It is because the adversities of its excessive use can affect its users in the social, physical, and mental spheres, as well as in the excessive use of video games, smartphones, and the Internet (Ort, 2021). With symptoms being felt by binge-watchers are the same ones pointed out by the World Health Organization (WHO) as problematic symptoms of addiction to new technologies (Starosta et al., 2021).

It should be noted that the global pandemic of COVID-19 may have led to an increase in the practice of binge-watching, motivated by social isolation, so that, to meet their needs and deal with boredom or anxiety, individuals seek sessions of this nature to entertain (Dixit et al., 2020).

However, binge-watching as a trend has also drawn attention to Environmental, Social, and Governance (ESG) related concerns. As environmental and social awareness grows, questions arise about the energy impact of the data centers that support these platforms and about working conditions in the entertainment industry. It highlights the need for a more sustainable and ethical approach to how to consume content, directing attention to immediate enjoyment and the broader consequences of our entertainment choices (Nitlarp & Kiattisin, 2022).

In addition, it is emphasized that media consumption plays a crucial role in many people's daily lives, being actively used to recover from emotional and cognitive exhaustion (Perks, 2019). As a result, people may watch excessively to entertain themselves, cope with boredom, and prevent loneliness during isolation, or they may watch to escape the anxiety generated by worries about difficulties related to the pandemic scenario (Starosta et al., 2020).

By carrying out an evaluation of the publications made on the subject on the scientific platforms Scopus and Web of Science (WoS). A total of 125 articles on the topic were found, 85 of which were published between 2019 and 2021. Despite the growing number of academic publications on the topic, the concept needs a standardized definition. However, it is generally defined as the self-determined consumption of several program episodes consecutively over a short period (Panda & Pandey, 2017). For example, Netflix defined it as watching two to six episodes of the same show at once. In comparison, some scholars define this behavior as watching at least two episodes of the same series without interruption (Castro et al., 2021).

Therefore, based on state of the art, this research seeks to contribute with an original theoretical model on the problematic practice of binge-watching to identify the main constructs that explain how marathoning behavior and how the main theories are related to this study, mainly, at the time of the COVID-19 pandemic when the use of streaming service was intensified (Anghelcev et al., 2022; Ferdchaud et al., 2022; Liza et al., 2022; Song et al., 2022).

In short, given the growth of binge-watching over the last few years and, particularly during the COVID-19 pandemic, it is necessary to develop studies that cover the consequences that the excessive use

of this practice can bring to viewers. Additionally, it is essential to conduct studies involving the Brazilian population, given the lack of research and published articles that focus on the practice of binge-watching and its consequences for the well-being of Brazilians.

Given the relevance of this social problem, the general objective of this research is to understand how the predictors of social anxiety (Mattick & Clarke, 1998), depression (Lovibond & Lovibond, 1995), boredom (Farmer & Sundberg, 1986) and development of parasocial relationships (Rubin et al., 1985) affect the problematic practice of binge watching (Young, 1998).

The multivariate techniques in two stages - Structural Equation Modeling (SEM) and Necessary Condition Analysis (NCA) were used as methodological strategies. The use of the NCA highlighted the degree of relevance of the independent variables with the dependent variable (Dul, 2016).

The article is organized into five sections. Section 2 highlights the relevant literature, and the hypotheses, research methodology, results and discussion are presented in sections 3, 4 and 5, respectively, and finally, the conclusions are presented in section 6.

Theoretical Basis

The problematic practice of binge watching

Technological advances have contributed to the emergence of new consumption behaviors that can potentiate excessive practice, with binge-watching being a model of media consumption that reflects such changes (Flayelle et al., 2019b; Flayelle et al., 2020; Song et al., 2022). In this context, binge-watching can be understood as part of the strategies of on-demand streaming companies for movies and series, which seek to produce content that engages and keeps viewers interested in their productions for long periods in order to reduce the likelihood that such viewers will cancel their monthly subscriptions (Jenner, 2015; Song et al., 2021).

Additionally, during the pandemic and isolation, major streaming companies continued to release several series that allowed people to engage in marathons and enter this mode of consumption (Raza et

al., 2021). As for consumer motivations, studies support the understanding that social interaction, escape from reality, easy access to content, the effectiveness of advertising by content providers, among others (Panda & Pandey, 2017; Shim et al. ., 2018), motivate individuals to watch more and more, and that the more they watch series in the binge-watching format, the more they tend to return to the practice to be satisfied (Panda & Pandey, 2017).

Thus, although binge-watching provides relaxation, involvement, and hedonism for spectators, its practice can be related to several negative consequences (Merikivi et al., 2020). As a result, concern about this social phenomenon has been motivated by the possible consequences for the physical and mental health of viewers, potentially being associated with long-term health problems such as obesity and heart disease (Flayelle et al., 2019a), neglect at work or in social relationships, procrastination at bedtime, and increased consumption of unhealthy foods (Starosta & Izydorczyk, 2020). In addition, people with problem-watching behavior have been found to exhibit similar symptoms to those with substance dependence problems (Shim et al., 2018). For Boca (2019), the unhealthy form of binge-watching may be related to the characteristics of on-demand streaming platforms and individual psychological predispositions (Starosta et al., 2021).

It is also noteworthy that the term 'binge' comes from English and has a negative connotation, often used to refer to problematic behaviors such as binge drinking (alcoholism) and binge eating (compulsive eating) (Feijter et al., 2016; Jenner, 2015). In addition, psychological symptoms associated with the individual's lack of self-control identified in binge eating, binge drinking, and compulsive shopping can be found in the compulsion to watch television (Burmeister & Carels, 2014; Song et al., 2021) and, consequently, in the binge-watching.

In this context, there is growing evidence that the prolonged practice of binge-watching can become problematic, generating harmful consequences for viewers, such as problems related to sleep, physical inactivity, and depression (Shim et al., 2018). In addition to increased anxiety due to social isolation caused by time spent watching series alone (Vaterlaus et al., 2019). In addition, the problematic practice of binge-watching is composed of six symptoms: (i) habit of binge-watching, promoting positive

emotions and regulating emotions; (ii) habit of hiding time spent watching; (iii) loss of control over time spent watching; (iv) health problems (lack of sleep, poor diet); (v) concern (the individual searches for more information about the content consumed); and (vi) negative social consequences (Starosta et al., 2021).

Therefore, based on what was presented, the problematic practice of binge-watching was chosen as the dependent variable of the study conducted.

Predictors of the theoretical model

Parasocial Relationships (PR)

The parasocial relationships construct can be understood as a unilateral interpersonal relationship that viewers establish with media characters, where a bond of intimacy is developed through shared experiences, being a functional alternative to interpersonal relationships for some people (Bond, 2021; Ferdchaud et al., 2022).

In this context, according to the notion that increased engagement increases the impact of media consumption on individuals' beliefs, emotions, or behaviors, binge-watching was related to higher levels of identification with characters with which the adherents of the behavior developed relationships. stronger parasocial (Flayelle et al., 2020).

Thus, such relationships are symbolic and characterized by repeated exposure to the media character or figure, resulting in viewers' engagement with narrative media (Erickson et al., 2019). Parasocial relationships typically reflect social relationships, but connections to media characters can become increasingly salient in times of distress, such as during the COVID-19 pandemic (Bond, 2021; Liza et al., 2022).

Hence, a study conducted by Bond (2021) identified that participants with reduced face-to-face interaction during the pandemic had greater intensity of parasocial relationships, indicating the validity of the parasocial compensation hypothesis (Bond, 2021), which indicates that such relationships can play a compensatory role in individuals' interpersonal needs (Madison et al., 2016).

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In this context, people who feel lonely and isolated or have social skill problems may develop more intense parasocial relationships to satisfy an individual's need to belong (Bérail et al., 2019). That is, social anxiety may play the role of moderator between the parasocial relationships with the characters of the series and the practice of binge-watching.

Thus, the research hypothesis defined for dealing with this construct was determined as follows:

$H_{1(+)}$: Parasocial relationships increase the problematic practice of binge-watching.

Social Anxiety (SA)

Social anxiety can be understood as excessive and persistent fear in social situations that require interaction that, in most cases, are painfully and reluctantly avoided or endured by the individual (American Psychiatric Association, 2013). The persistent discomfort and fear that individuals with social anxiety feel make it more difficult to establish positive relationships. As a result, several studies have shown that socially anxious individuals use the Internet to meet social needs less painfully, thus associating social anxiety with the development of problematic Internet use in individuals (Bérail et al., 2019).

Considering that the more socially anxious an individual is, the more he may develop problematic Internet use (Ostovar et al., 2016), social anxiety can be considered a predisposition to problematic Internet use and, consequently, to the practice of binge-watching.

This thesis can be supported, as there is a positive association between time spent consuming television media and the individual's anxiety (Wit et al., 2011), in which individuals with greater social anxiety are more likely to watch compulsively due to a sense of closeness with the characters. That is, binge-watching can allow viewers to participate in virtual social interactions. (Sun & Chang, 2021). Thus, individuals who feel anxious about social interactions may seek virtual social interactions or relationships through binge-watching.

Thus, the following hypothesis was formulated:

$H_{2(+)}$: Social anxiety increases the problematic practice of binge-watching.

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Boredom (BO)

Boredom can be understood as a state of low arousal and dissatisfaction that is attributed to an environment with inadequate stimulation (Chou et al., 2018). In a state of boredom, the world appears to be uninteresting. That is, there is a loss of value, significance, or meaning, in which nothing in the current situation leads individuals to get involved (Elpidorou, 2014). The tiredness that is experienced when we are bored is compounded by the perception of a slower passage of time, making the experience of boredom even more aversive to the individual (Sackett et al., 2010).

When an episode of boredom arises, the absence of necessary emotional stimuli for the individual leads to the search for alternative experiences that suppress the feeling, even if these experiences have a negative impact on their well-being (Whelan et al., 2020). Therefore, boredom can be related to behavioral disorders such as depression, anxiety, anger, aggression, a lower tendency to become involved in thoughts or to enjoy thinking, a propensity to make mistakes in common tasks, deficiencies in interpersonal relationships and social, lower satisfaction with work and life (Elpidorou, 2014).

Furthermore, boredom is a widespread emotional state and often results in substance use and abuse and more extreme behaviors such as binge drinking and Internet abuse (Chou et al., 2018). Teenagers with a high propensity for boredom are reported to be more at risk of Internet addiction than non-bored teens. As a result, boredom has proven to be a common trigger for intensive Internet use and can result in problematic usage behavior (Wang, 2019). Based on the above, the following hypothesis was formulated:

$H_{3(+)}$: Boredom increases the problematic practice of binge-watching.

Depression (DE)

Depression is an unpleasant emotional state confirmed by various symptoms, such as negative and pessimistic attitudes and impulsivity loss (Ostovar et al., 2016). It can lead to poorer psychosocial functioning, lower life and career satisfaction, more interpersonal difficulty, a greater need for social support, and a higher risk of suicide (Primack et al., 2009). The contents present in the media tend to lead

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to depression more directly through the constant comparison that viewers can make of themselves with images of highly idealized characters and situations (Bulck, 2000).

Some research has demonstrated a positive relationship between frequent binge-watching and symptoms of depression and loneliness (Starosta et al., 2021; Sun & Chang, 2021), in addition to indicating that such symptoms are a precise predictor of loss of control over binge-watching time (Steins-Loeber et al., 2020).

In addition, some psychological states present in binge eating, such as avoidance of negative thoughts and depressive symptoms, are similar to those linked to excessive consumption of television programs (Anghelcev, Burmeister & Carels, 2014; Song et al., 2022). In this context, it was identified that viewers who are more depressed tend to perform marathons more often and may even feel more depressed after a binge-watching session, in the same way, that binge eaters' mood tends to become even more depressed. Therefore, the following hypothesis was defined: negative after an episode of binge eating (Feijter et al., 2016).

$H_{4(+)}$: Depression increases the problematic practice of binge-watching.

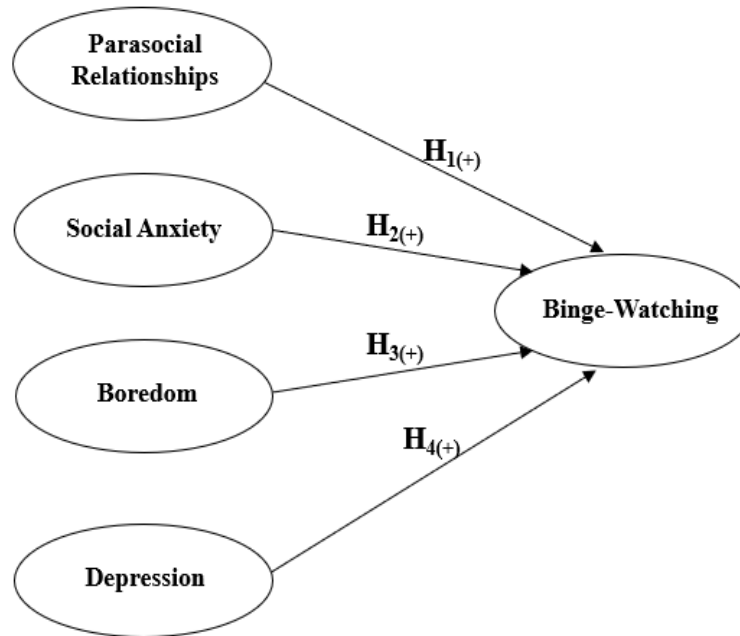Figure 1 shows the theoretical model used in this study.

Figure 1. Theoretical model for analyzing the problematic practice of binge-watching

Method

Participants and data collection

The criterion used for the selection of research participants was the practice of binge-watching. Data collection was carried out through an online questionnaire made available on the QuestionPro platform. The assertions used were measured using the 5-point Likert scale adapted from psychometric scales selected for the context of the present study.

In this sense, the sample is classified as non-probabilistic for convenience and judgment, aiming to provide insights and hypotheses about the practice of binge-watching arising from its exploratory nature. A pre-test was conducted with 30 individuals to verify their understanding of the research

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instrument (Hair et al., 2010). At the end of data collection, 467 answered questionnaires were obtained, which were subjected to removing outliers using the Mahalanobis distance (Hair et al., 2018). Seventy-nine questionnaires were removed in this process, resulting in a final sample of 388 respondents.

Choice of Method, Common Method Bias, Collinearity and Normality

First, it was decided to carry out the Partial Least Squares Structural Equation Modeling (PLS-SEM Regular – see the code in Appendix 2) and Necessary Condition Analysis (NCA – see the code in Appendix 3), analyzed with the R software (SEMinR library), which allows the calculation of partial regression relationships in the measurement and structural models using regressions of separated common least squares (Hair et al., 2014).

The common method bias was used to group the constructs used in a single factor, to assess their level of explanation, in order to corroborate the validity of the study conducted. Thus, Harman's single factor test was applied, in which the 36 variables of the model were grouped, generating a single factor whose explanatory value was 45.91%. As stated in the Applied Social Sciences literature, levels below 50% indicate the validity of the variables used (Shahzad et al., 2020), thus not indicating problems in the constructs used in the present study.

Then, the variance inflation factor (VIF) was verified to analyze the collinearity of the constructs used. Table 1 presents the values identified for each of the variables used in the research. The mean coefficients identified were BW= 1.97, PR = 2.07, SA= 3.84, DE=2.98 and BO =2.53. In addition, it was evaluated that all VIF of the variables used in the study remained below 5. According to the literature, VIF values below 5 do not indicate problems of collinearity between the variables (Hair et al., 2018).

First, data normality was verified by asymmetry and kurtosis using the Mardia multivariate test ($p<0.001$). Such results indicate the non-normality of the data, which was already foreseen in studies of a social nature. This procedure was necessary to limit the possibility of using some statistical analysis techniques whose characteristic is the normal distribution of data.

Table 1.
Analyzes performed on the variables using the R software

Construct	Item	Cross-loading	Mean	Standard deviation	VIF
	BW1	*	*	*	*
	BW2	0.743	2479	1.015	2.23
	BW3	*	*	*	*
	BW4	*	*	*	*
	BW5	0.752	2.018	1.065	2.24
	BW6	*	*	*	*
	BW7	*	*	*	*
	BW8	*	*	*	*
Binge-Watching	BW9	*	*	*	*
(BW)	BW10	*	*	*	*
VIF= 1.97	BW11	*	*	*	*
	BW12	0.755	2.173	1.034	1.81
	BW13	*	*	*	*
	BW14	*	*	*	*
	BW15	0.757	2.296	1.131	1.87
	BW16	0.771	1.668	1.057	2.03
	BW17	0.711	2.430	1.271	1.55
	BW18	0.781	1.580	0.913	2.04
	PR1	0.757	3.299	1.196	1.93
	PR2	0.762	3.201	1.112	1.95
Parasocial	PR3	0.751	2.791	1.235	1.83
Relationships (PR)	PR4	0.832	2.928	1.290	2.33
VIF= 2.07	PR5	0.772	3.116	1.471	2.20
	PR6	0.818	2.639	1.315	2.12
	PR7	0.769	3.165	1.219	2.11
Social Anxiety	SA1	0.809	2.026	1.104	2.75
(SA)	SA2	0.875	2.286	1.165	4.51

VIF= 3.84	SA3	0.859	2.291	1.220	4.07
	SA4	0.892	2.211	1.149	4.51
	SA5	0.889	2.392	1.292	4.47
	SA6	0.812	2.348	1.288	2.57
	SA7	0.883	2.474	1.238	4.36
	SA8	0.883	2.637	1.226	4.06
	SA9	0.854	2.224	1.251	3.87
	SA10	0.838	2.608	1.280	3.19
	SA11	*	*	*	*
Depression (DE) VIF= 2.98	DE1	0.873	2.198	1.172	3.02
	DE2	0.89	2.322	1.180	3.06
	DE3	0.892	2.026	1.166	3.22
	DE4	0.877	2.554	1.179	2.99
	DE5	*	*	*	*
	DE6	0.847	2.482	1.206	2.60
Boredom (BO) VIF= 2.53	BO1	0.764	2.760	1.147	2.18
	BO2	0.837	2.425	1.101	2.70
	BO3	0.857	2.539	1.171	2.79
	BO4	0.856	2.129	1.147	2.84
	BO5	0.838	2.541	1.231	2.65
	BO6	0.848	2.345	1.141	2.82
	BO7	0.722	2.116	1.145	1.70

(*) Items removed in the model adjustment phase.

Stages of Research Analysis

Stage 1: Measurement of Structural Equation Modeling (SEM)

The first step involved the evaluation of the indicator loads, where values above 0.708 are recommended because they indicate that the construct explains more than 50% of the indicator's variance, evidencing the acceptable reliability of the analyzed item. In addition, the reliability of the internal

consistency of the model was evaluated, which values between 0.60, and 0.70 identified, being considered 'acceptable in research' and the values 0.70 and 0.90 vary from 'satisfactory good' (Hair et al., 2014).

Then, the correlation and the convergent and discriminant validity of the constructs used were evaluated. Such analyzes are evaluation methods to measure the level of correlation of multiple indicators in the same structure (Shahzad et al., 2020). In order to corroborate the convergent and discriminant validity of each item, using the R software, confirmatory factor analysis (CFA), the average variance extracted (AVE) and the composite reliability (CR) were used.

As provided in the literature, for these analyzes, only variables that present a cross-factor loading (resulting from the CFA) greater than 0.7 (Shahzad et al., 2020) are accepted. Thus, as provided in Table 1, all variables used in the study presented values above 0.7, ranging from 0.711 to 0.889.

In addition, Table 1 shows the values identified for Cronbach's Alpha (CA), which ranged between 0.873 and 0.961, for AVE, which ranged between 0.610 and 0.767, and for CR, which ranged between 0.902 and 0.966. Thus, all the values found were above the parameters established by the literature and indicate that there are no problems of convergent validity and reliability. For the research instrument to be considered reliable and adequate, it is recommended that CA and CR values be greater than 0.7, while the values for AVE should be greater than 0.5.

For discriminant validity, which consists of the extent to which the variables are empirically different from each other, being a necessary prerequisite to evaluate the relationships between the potential variables, the Fornell-Larcker criterion was used, according to values in bold from Table 2.

Table 2.
Correlation and Convergent and Discriminant Validity

Constructs	(1)	(2)	(3)	(4)	(5)
(1) Parasocial Relationships	**0.781**				
(2) Social Anxiety	0.463	**0.860**			
(3) Depression	0.534	0.608	**0.876**		
(4) Boredom	0.572	0.593	0.787	**0.819**	
(5) Binge-Watching	0.589	0.551	0.684	0.728	**0.753**

Cronbach's Alpha (CA)a	0.893	0.961	0.924	0.917	0.873
p-rho by Dillon Goldstein	0.900	0.962	0.925	0.922	0.873
Composite Reliability (CR)b	0.916	0.966	0.943	0.934	0.902
Average Variance Extracted (AVE)c	0.610	0.739	0.767	0.671	0.567
Coefficient of determination (R^2)					0.602
Effect size (F²)	0.069	0.015	0.039	0.122	0.000

Note. Recommended threshold value: $a_{AC} \geq 0.7; b_{CC} \geq 0.7; c_{VME} \geq 0.5$
The values of $\sqrt{AVE}$ *(highlighted in bold) are on the diagonal of the correlation matrix.*

Additionally, the Heterotrait-monotrait ratio (HTMT) developed to specify the insensitivity of the Fornell-Larker discriminant validity criteria and the criterion of crossed factor loadings was applied. Thus, as shown in Table 3, the highest HTMT value identified was 0.820, demonstrating that this study's discriminant validity is adequate. Thus, values greater than 0.850 indicate a lack of discriminant validity in analyzing the relationships between variables and the distinction of factors (Hair Jr et al., 2014).

Table 3.
HTMT

	Parasocial Relationships	Social Anxiety	Depression	Boredom	Binge-Watching
Parasocial Relationships	.	.	.	.	.
Social Anxiety	0.495	.	.	.	.
Depression	0.585	0.643	.	.	.
Boredom	0.625	0.629	0.820	.	.
Binge-Watching	0.659	0.591	0.758	0.809	.

Stage 2: Necessary Conditions Analysis (NCA)

The second step consisted of applying NCA, which is a technique that consists of generating a scatter plot between two variables X and Y in which X is necessary for Y. With this, we seek to assess the level of need between these variables, where without X, Y cannot exist (Dul, 2016). In this analysis model, contrary to linear regression models, there is the creation of a scatterplot, with the size of the space identified in the upper left corner of the graph, suggesting a need relationship between the analyzed

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variables. Therefore, the larger the upper left area, the greater the identified relationship. Additionally, it is possible to identify minimum levels of necessary conditions of the independent variables for varying degrees of explanation of the dependent variable by measuring the line surrounding the upper left roof, called CE-FDH (Dul, 2016; Tho, 2019).

Furthermore, it is important to measure the size of its effect within the NCA. This process is done by comparing the size of the upper left area identified in the scatterplot and the total size of the area with the observations. Thus, the effects can be classified as follows: from 0 to 0.1, the effect size is considered small from 0.1 to 0.3, the effect size is considered medium from 0.3 to 0.5 size of the effect is considered large and greater than 0.5, the effect size is considered very large (Dul, 2016; Tho, 2019).

Results

The present study achieved its objective of analyzing the impact of the Vale disaster, which occurred in 2019, on the corporate reputation of the company Vale. Thus, an investigation of the mining company's reputation was carried out on the dimensions: media, academia, company and society. In addition to these dimensions, the study also verified corporate reputation at the boundary between society and company dimensions.

The results showed that there is a synergy between the different dimensions and the behavior of the mining company's actions, and in all of them, the behavior was noticed that in the years prior to the dam failure, the company had a reputation that guaranteed its legitimacy. , but in the year of the incident, this reputation was strongly affected and in the years after the dam failure, Vale's organizational communication apparently managed to establish a façade behavior that put into effect a set of positive images capable of restoring the mining company's reputation and maintain the legitimacy for the company to continue operating.

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The research identified that, after the disaster, the company sought to demonstrate a reformulation of its actions in its economic-financial and sustainability reports, wich according to the social action theory can be considered a façade behavior towards its stakeholders . The results confirmed the findings of Góis *et al*. (2017) when observing that the entity sought to regain its reputation, after the dam rupture, as a way of creating value and re-establishing its social pact, wich according to the legitimacy theory, means that the company sought to maintain its rights, towards society to operate. The studies by Góis and Soares (2019) were also reinforced by observing a greater competitiveness of the company when its reputation was not affected by the disaster. However, the period in which the company presented a loss, in its economic-financial reports, was in the year of the tragedy, so that considerable losses were also observed in the price of the company's shares, in which it took a year for the resumption of the pre-disaster price level.

As a limitation of the study, there is the failure to carry out questionnaires and the non-use of statistical tools, which could provide relevant information in the dimension of 'society'. It is suggested for future research, the analysis of other dimensions of the company, such as the 'State', which can be analyzed by observing the legislation and public policies related to the company and its economic sector. In addition, it is recommended the application of other research techniques capable of analyzing the company's reputation over a longer period of time. Finally, it is suggested to analyze the reputation of other companies with polluting potential.

Demographic profile

Based on the data collected, it was possible to identify that more than half of the sample, 53% (n=206), comprises individuals up to 25 years old, primarily women 84% (n=173). Additionally, it was evidenced that both sexes perform marathons at least once a week, with 19.6% (n=39) of men and 80.4% (n=160) of women.

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The equipment used to perform marathons in both groups is television, with 60% (n=51) of men and 52.8 (n=160) of women. The second most used equipment by the female group is the smartphone, with 30.7% (n=93), while for the male group, computer use was identified with 22.4% (n=19).

For the number of hours that the user spends performing the marathons, it was identified that 30% (n=66) of the users were "Up to 25 years old", 57.5% (n=23) of the users "from 36 to 45 years old" and 43.2% (n=16) of users "Over 46 years old" perform marathons of up to 3 hours. For the group "From 26 to 35 years old", marathons "From 3 to 4 hours" were more representative, with about 32.4% (n=34) of the respondents.

In addition, it was evaluated that all age groups showed an increase in the practice of binge-watching during the COVID-19 pandemic, with 58.2% (n=226) of the sample. Then, it was identified that the female group had higher rates of performing marathons alone, with 75.2% (n=228), which was the case for 45% (n=46) of male respondents. Regarding the number of users per streaming platform, Netflix occupies a leading position, 92% (n=357) of the sample.

Stage 1: Structural Equation Modeling (SEM)

After validating the convergent and discriminant reliability of the research model, the hypothetical relationship between the constructs was measured using the R software SEMinR database. The analysis's significance level was measured using the bootstrap method, with 5000 subsample iterations to provide T-values of the structural path significance tests (Shahzad et al., 2020). The values of the path coefficients are presented in Table 4.

Additionally, R^2 determined the proportion of variation in the dependent variable that can be explained by one or more independent variables, with values of 67%, 33% and 19% being considered substantial, moderate, and weak, respectively (Chin & Marcoulides, 1998). The adjusted R^2 value of the dependent variable was 0.602, 60.2%, with values considered moderate.

The F^2 or effect size indicates the relative effect of an exogenous latent variable on endogenous variables through changes in R^2. It is calculated as the increase in R^2 of the latent variable to which the

path is connected about the proportion of unexplained variance of the latent variable (Chin & Marcoulides, 1998). The F^2 identified ranged from 0.015 to 0.122, and the values were classified as having a low effect.

In addition, the Goodness of fit of the model (GOF) was calculated to measure the performance of the model made in which we obtained a value of 0.4931. Considering that values above 0.36 are considered high, it is concluded with the adaptability of the structural model.

Table 4.
SEM – Bootstrapping results for hypothesis testing

Hypotheses	Paths	β	Bootstrapring	t-Test	2.5 % CI	97.5 % CI
$H_{1(+)}$	PR → BW	0.211	0.209	5.213(**)	0.131	0.287
$H_{2(+)}$	SA → BW	0.097	0.096	2.410(*)	0.014	0.171
$H_{3(+)}$	BO → BW	0.384	0.386	7.048(**)	0.270	0.490
$H_{4(+)}$	DE → BW	0.211	0.215	3.729(**)	0.110	0.325

Note: **$p < 0.001$; *$p<0.05$; CI: Confidence Intervals.

As shown in Table 4 and Figure 2, all research model paths were positive and statistically significant. Therefore, the proposed model corroborated all the proposed hypotheses.
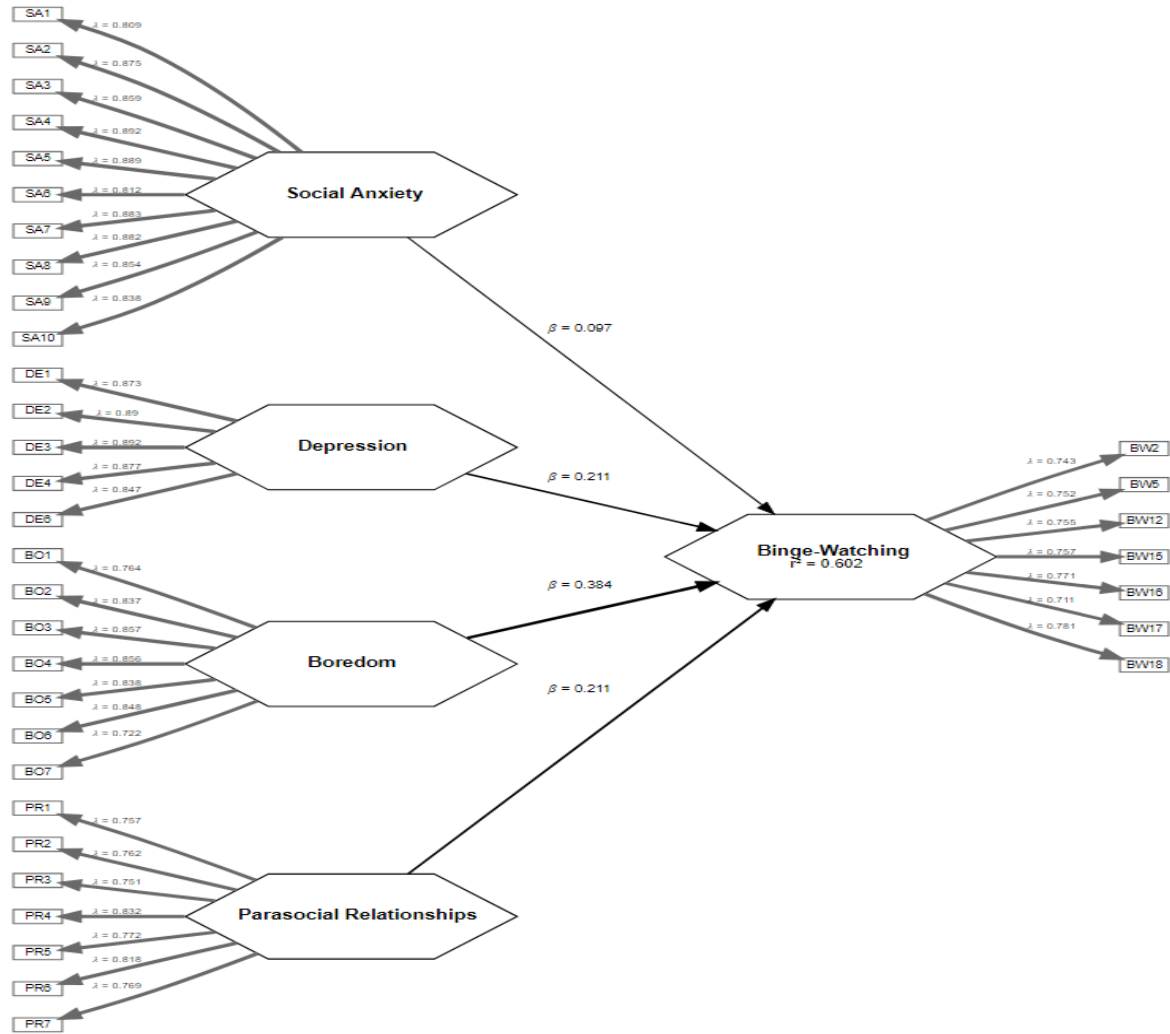
Figure 2. Structural Equation Modeling Results.

Stage 2: Necessary Conditions Analysis (NCA)

To perform the Analysis of Necessary Conditions, the R software, NCA database, was used to evaluate the relationship of need between the dependent variable Binge-Watching (BW) and the independent variables Social Anxiety (SA), Depression (DE), Boredom (BO) and Parasocial Relationships (PR). Thus, Figure 3 demonstrates that all evaluated relationships suggested a need relationship, given the spaces identified in the upper left corner of each scatterplot.
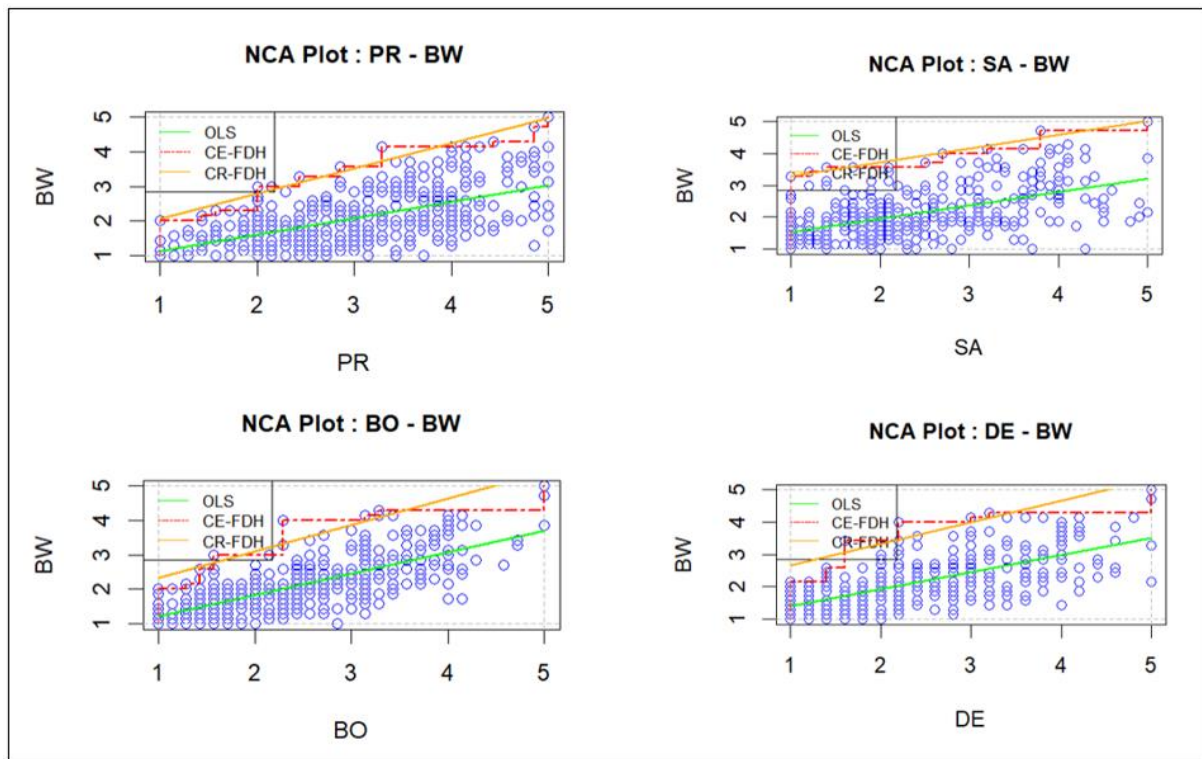

Figure 3. Scatterplot of the constructs BW (Binge-Watching), AS (Social Anxiety), DE (Depression), BO (Boredom) and PR (Parasocial Relationships).

In addition, as shown in Table 5, the variables Social Anxiety and Depression have a median effect in providing explanations about the dependent variable Binge Watching. On the other hand, the variables Boredom and Parasocial Relationships suggested a large effect of need between the independent and the

dependent variables. Furthermore, the low values of the value and accuracy of "p" indicate the improbability of the values resulting from random analyzes (Dul et al., 2020), increasing the credibility of the size of the effects.

Table 5.
NCA analysis

Construct	p value	Accuracy of p	Slope	Effect size	Effect classification
Social Anxiety	$p < 0.001$	$p < 0.001$	0.430	0.240	Medium
Depression	$p < 0.001$	$p < 0.001$	0.670	0.302	Medium
Boredom	$p < 0.001$	$p < 0.001$	0.767	0.328	Large
Parasocial Relationships	$p < 0.001$	$p < 0.001$	0.724	0.399	Large

Table 6 contains the CE-FDH analysis that shows the minimum values necessary for each independent variable to provide levels of explanation about the dependent variable (Dul, 2016). For example, to reach 60% of explanations about Binge Watching, it would be necessary to have Social Anxiety at least 5%, Depression at least 15%, Boredom at least 32.1%, and Parasocial Relationships at least 46.4%.

Table 6.
Bottleneck CE-FDH results

Y= Binge-Watching	Social Anxiety	Depression	Boredom	Parasocial Relationships
0	NN	NN	NN	NN
10	NN	NN	NN	NN
20	NN	NN	NN	NN
30	NN	10.0	10.7	14.3
40	NN	15.0	14.3	25.0
50	NN	15.0	14.3	25.0
60	5.0	15.0	32.1	46.4
70	42.5	30.0	32.1	57.1

80	70.0	55.0	57.1	85.7
90	70.0	NA	NA	96.4
100	NA	NA	NA	NA

Note. NN – not necessary; NA - not available.

Discussion

Based on the results, it is possible to affirm that there is a direct relationship between social anxiety, depression, parasocial relationships, and boredom in the face of the problematic practice of binge-watching. Thus, more intense degrees of these precursors lead to higher degrees of this problematic practice. Thus, the present study corroborates the findings of Starosta et al. (2021) and Sun and Chang (2021), which indicate a relationship between social anxiety and depression with binge-watching.

The T-test and ANOVA performed indicated that, after analyzing the means of the sex group in relation to the grouped mean boredom, both respondents did not show differences ($t_{(386)}$ =0.782; p=0.434) indicating that both sexes are affected by boredom to the same degree. When analyzing the age of the respondents, it was identified that the group 'up to 25 years old' presented a higher degree of boredom than the other groups ($\bar{x}_{up\ to\ 25\ years} = 2.55; DP = 1.001; F_{(3,\ 384)} = 4.219; p = 0.006$). Furthermore, as age increases, boredom decreases even in the '26-45 years' group. After this age group, boredom starts growing again. This is due to the fact that each group receives different stimuli during life from personal and professional activities.

Additionally, we sought to assess the relationship between boredom and the practice of marathons before and during the pandemic, where it was possible to identify that there was an increase in practice during the pandemic ($t_{(386)}$ =2.627; p=0.009), which can be related to the lack of entertainment alternatives.

Finally, a T-test was carried out to identify whether there was a difference between the feeling of boredom between individuals who usually performed binge watching alone or with others. As a result,

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higher levels of boredom associated with users who performed the practice without company were identified t($_{386}$) =3.217; p<0.001).

Conversely, H$_2$ (AS → BW; β=0.097) presented the lowest values, indicating a lower degree of explanation of the predictor in the relationship with binge-watching, but still validating the research hypothesis. It is because social anxiety is characterized by an excessive and persistent fear of interaction in social situations that compromise the ability to develop bonds with other affected individuals, which impacts the development of social skills. Thus, those affected look for alternative ways to establish interpersonal connections, often resorting to the use of technological resources such as the abusive use of the internet, video games, social networks, and binge-watching due to the feeling of proximity to the characters (Sun & Chang, 2021).

In addition, we sought to assess the relationship between the degrees of social anxiety and the practice of marathons before and during the pandemic to identify the impact of isolation on the relationship between AS and BW. The result ($\bar{x}_{During} = 2.39; DP = 1.018; F_{(1,\ 386)} = 1.065; p = 0.228$) showed that the pandemic context did not change the perception of the relationship between social anxiety and the practice of binge-watching. However, this finding indicates that the degree of interaction between the constructs remained stable and that social anxiety plays a role as a precursor of the practice, as identified in a previous study that sought to understand the excessive use of technology (Ostovar et al., 2016).

Regarding the hypothesis H$_1$ (RP → BW; β=0.211) it was evaluated that the parasocial relationship presented the second highest value in the analysis to explain the binge-watching phenomenon. Such findings corroborate the idea that the immersive experience of binge-watching (Pittman & Steiner, 2019) is capable of creating a more intense narrative environment and establishing longer lasting parasocial relationship bonds between viewers and the characters, instigating greater user engagement in the marathons (Erickson et al., 2019; Ferdchaud et al., 2022).

Through the T-test, it was identified that women had higher rates of parasocial relationship (t($_{386}$)=5.287; p<0.001) than men. When verifying the age of the respondents, we identified that the group 'up to 25 years old' presented a higher degree of parasocial relationships than the other groups

$(\bar{x}_{At\acute{e}\ 25\ anos} = 3.21; DP = 0.992;\ F_{(3,\ 384)} = 7.532; p < 0.001)$. In addition, as age increases, the degree of parasocial relationships begins to decline, corroborating the findings of the study conducted by Bond (2018) that identified the development of more intense parasocial relationships in younger individuals.

During the analysis of the degree of parasocial relationships with the practice of binge watching, before and during the pandemic, it was found that there was an increase in the levels of parasocial relationships in individuals who started to perform more marathons during the pandemic ($t_{(386)}$=2.564; p<0.001). This finding supports the understanding that parasocial relationships can become more intense to meet the needs of individuals and, in the context of social isolation, they can play a compensatory role (Bond, 2021; Madison et al., 2016).

In addition, through ANOVA, it was identified that respondents who performed marathons every day had higher rates of parasocial relationships with the characters ($\bar{x}_{Everyday} = 3.29; DP = 0.957;$ $F_{(3,\ 384)} = 7.541; p < 0.001$) corroborating the literature (Flayelle et al., 2020), showing a decrease in the other frequencies up to 'once a month' and gradually increasing again in "several times a year", the which may be related to vacation and holiday seasons that allow users to engage more actively in this type of consumption (Song et al., 2022).

Finally, hypothesis H4 (DE → BW; β=0.211) corroborating the understanding that individuals with higher degrees of depressive symptoms are more involved in the practice of binge-watching. The T-test analyzes ($t_{(386)}$=4.049; p<0.001) indicated that the depressive symptoms felt by the individuals were associated with the increase in the consumption of series during the pandemic, in line with what was found in the literature regarding the relationship between depressive symptoms and binge watching (Feijter et al., 2016). In addition, the finding indicates that users have used the practice to deal with anxiety, depression, and distress (Starosta et al., 2021).

Additionally, through the ANOVA analysis to understand the relationship between the frequency of practice and the degree of depressive feelings of the user, it was found that users who perform marathons 'every day' had higher levels of depressive symptoms than the other groups ($\bar{x}_{Everyday} = 2.55; DP =$

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1.103; $F_{(3, 384)} = 5.970; p = 0.019$), corroborating the idea that depression is a precursor to binge watching, according to a previously conducted study by Steins-Loeber et al. (2020).

Conclusion

This study aimed to understand how the predictors of social anxiety, depression, boredom, and the development of parasocial relationships affect the problematic practice of binge-watching. The present study was able to show that the practice, associated with the psychological predisposition of individuals, can lead to the development of negative symptoms similar to addiction in various technologies, compromising the individual's life both physically and psychologically. This phenomenon intensified during the COVID-19 pandemic when binge-watching was used for distractions, entertainment, and to manage the negative sensations arising from the pandemic (Dixit et al., 2020).

In addition, the study fulfills the role of making individuals aware of the problems associated with this practice, given that binge-watching is still an unknown term by the population, being a practice not often associated with problems of compulsion, despite often leading to that. Second, the accessibility of innovative technologies and some structural factors of streaming platforms are designed to maintain viewer engagement, which can lead to loss of control (Starosta et al., 2021). For example, companies perceive the public's preference for this type of consumption and increasingly develop strategies to engage the public in this practice (Jenner, 2015). For example, several channels are put on weekends or during certain times of the day month to rerun several episodes in a row of popular series and create programs for users to participate in games that reward this behavior.

However, given the predispositions of some users, companies must create effective mechanisms to support those who, by themselves, cannot perform binge-watching without affecting other spheres of their lives. There are examples of companies, such as Netflix and Disney+, that when you are marathoning

a series for a long time, a reminder appears on the screen asking whether or not the individual intends to continue watching (Song et al., 2022).

On the other hand, it is known that companies use algorithms and artificial intelligence to keep their users engaged through, recommendations and communication with the customer in different channels, such as through messages in the mobile application when new series are released. Netflix, for example, also uses machine learning techniques to improve the recommendation system and customize the show's presentation cover, making them more attractive to a potential viewer. Thus, each viewer's unique past preferences are considered for presenting the cover of a show that is most attractive to them. The AI algorithm analyzes viewer metrics such as drop-out data (data about people who drop out midway through a show) and 28-day view data (the number of people who watched a series of a show within 28 days after the release). This data helps Netflix understand what makes a show successful and what viewers want (Ayushman, 2020).

It is worth noting that, in the context of ESG (Environmental, Social, and Governance), companies must commit to their social governance, thinking about strategies to optimize the achievement of profits, in the present study, subscriptions, without this compromising the health of the employees' individuals (related to the third objective of Sustainable Development – 'Health and Well-Being' in 2030 Agenda in Brazil). Additional research addressing this relationship would be essential to understand companies' commitment to their strategies' ethics and social responsibility.

Such advances reflect the high competitiveness of the market, which leads to the need to increase series production and maintain user engagement. However, with the high market competition and need for customer maintenance, is everything worth it? Even putting the client's mental health at risk? Thus, society needs to understand the fine line between healthy consumption and the problem of binge-watching because only then will companies begin to rethink their marketing approach.

As a suggestion for future work, it would be interesting to include some other factors identified during the conduct of the study as precursors of the practice, such as escape from reality and loss of control.

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Furthermore, the binge-watch concept is constantly changing, making room for new forms of uninterrupted consumption, such as those seen in the TikTok application. This platform allows users to watch short videos consecutively. The agile and captivating format attracts the public, promoting an uninterrupted consumption cycle that can last minutes or even hours. This quick succession of videos differs from the traditional series binge-watch, where the episodes have a fixed duration. On TikTok, the transition is more fluid, allowing users to immerse themselves in a wide range of content quickly.

In Brazil, the demographic context plays a significant role in this new consumption pattern. With a highly connected young population, adherence to TikTok has been significant. The culture of sharing and the ability to create content in an accessible way contributed to the rapid expansion of the platform in the country.

Comparatively, the trend of non-stop consumption is also reflected in other corners of the world. Each country, however, infuses its own cultural and socioeconomic particularities into this global phenomenon. In Asia, for example, K-drama (Korean dramas) has gained prominence as a form of binge-watch, driving a wave of cultural interest beyond Korean borders. Likewise, the Chinese market has seen the emergence of TikTok-like platforms tailored to local preferences. The evolution of the binge-watch only occurs uniformly everywhere. Each country has its dynamics and challenges, which justifies the need to conduct comparative research to understand better how different societies respond to these trends.

The limitations of this study are mostly associated with external validation, given that the majority of respondents in the analyzed sample were residents of the city of São Paulo and which has the highest rates of supporters of streaming technologies, being subject to comparison with samples obtained in other megalopolises.

Another limitation is associated with the predominance of females (300) compared to males (88), evidencing a greater female interest in the practice. This finding was also documented in a systematic literature review (Flayelle et al., 2020). Thus, it would be interesting to conduct studies with more male participants to extend the findings documented in this work.

'Are you still watching?' – A study on the predictors of the problematic practice of binge-watching

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References

American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders DSM-5. (5th ed.), American Psychiatric Publishing, Arlington, VA (2013). https://doi.org/10.1176/appi.books.9780890425596

Anghelcev, G., Sela, S., Justin, M. & Moultrie, J. L. (2022). Is heavy binge-watching a socially driven behaviour? Exploring differences between heavy, regular and non-binge-watchers. *Journal of Digital Media & Policy*, 13(2), 201-221. https://doi.org/10.1386/jdmp_00035_1

Ayushman, N. (2020). Binge-watching in quarantine? AI and Netflix have you covered! AI Daily - Artificial Intelligence News. https://aidaily.co.uk/articles/ainetflix

Bérail, P. de, Guillon, M., & Bungener, C. (2019). The relations between YouTube addiction, social anxiety and parasocial relationships with YouTubers: A moderated-mediation model based on a cognitive-behavioral framework. *Computers in Human Behavior*, 99, 190–204. https://doi.org/10.1016/j.chb.2019.05.007

Boca, P. (2019). Good Things Come to Those Who Binge: An Exploration of Binge-Watching Related Behavior. *Journal of Media Research*, 12(34), 5-31. https://doi.org/10.24193/jmr.34.1

Bond, B. J. (2018). Parasocial Relationships with Media Personae: Why They Matter and How They Differ Among Heterosexual, Lesbian, Gay, and Bisexual Adolescents. *Media Psychology*, 21(3), 457–485. https://doi.org/10.1080/15213269.2017.1416295

Bond, B. J. (2021). Social and parasocial relationships during COVID-19 social distancing. *Journal of Social and Personal Relationships*, 38(8), 2308–2329. https://doi.org/10.1177/02654075211019129

Bulck, J. V. D. (2000). Is Television Bad for Your Health? Behavior and Body Image of the Adolescent "Couch Potato". *Journal of Youth and Adolescence*, 29, 273-288. https://doi.org/10.1023/A:1005102523848

Burmeister, J. M., & Carels, R. A. (2014). Television use and binge eating in adults seeking weight loss treatment. *Eating Behaviors*, 15(1), 83–86. https://doi.org/10.1016/j.eatbeh.2013.10.001

Castro, D., Rigby, J. M., Cabral, D., & Nisi, V. (2021). The binge-watcher's journey: Investigating motivations, contexts, and affective states surrounding Netflix viewing. *Convergence: The International Journal of Research into New Media Technologies*, 27(1), 3-20. https://doi.org/10.1177/1354856519890856

Chin, W., & Marcoulides, G. (1998). The Partial Least Squares Approach to Structural Equation Modeling. *Modern Methods for Business Research*, 8.

Chou, W.-J., Chang, Y.-P., & Yen, C.-F. (2018). Boredom proneness and its correlation with Internet addiction and Internet activities in adolescents with attention-deficit/hyperactivity disorder. *The Kaohsiung Journal of Medical Sciences*, 34(8), 467–474. https://doi.org/10.1016/j.kjms.2018.01.016

Feijter, D. de, Khan, V.-J., & Van Gisbergen, M. (2016). Confessions of A "Guilty" Couch Potato Understanding and Using Context to Optimize Binge-watching Behavior. *Proceedings of the ACM International Conference on Interactive Experiences for TV and Online Video*. https://doi.org/10.1145/2932206.2932216

Dixit, A., Marthoenis, M., Arafat, S. M. Y., Sharma, P., & Kar, S. K. (2020). Binge watching behavior during COVID 19 pandemic: A cross-sectional, cross-national online survey. *Psychiatry Research*, 289, 113089. https://doi.org/10.1016/j.psychres.2020.113089

Dul, J. (2016). Necessary Condition Analysis (NCA): Logic and Methodology of "Necessary but Not Sufficient" Causality. *Organizational Research Methods*, 19(1), 10–52. https://doi.org/10.1177/1094428115584005

Dul, J., van der Laan, E., & Kuik, R. (2020). A Statistical Significance Test for Necessary Condition Analysis. *Organizational Research Methods*, 23(2), 385–395. https://doi.org/10.1177/1094428118795272

Elpidorou, A. (2014). The bright side of boredom. *Frontiers in Psychology*, 5. https://doi.org/10.3389/fpsyg.2014.01245

Erickson, S. E., Cin, D. S., & Byl, H. (2019). An Experimental Examination of Binge Watching and Narrative Engagement. *Social Sciences*. 8(1). https://doi.org/10.3390/socsci8010019

Farmer, R., & Sundberg, N. D. (1986). Boredom Proneness-The Development and Correlates of a New Scale. *Journal of Personality Assessment*, 50(1), 4–17. https://doi.org/10.1207/s15327752jpa5001_2

Ferchaud, A., Yan, Z., & Daniel, E. S. (2022). Binging on the Heartbreak: The Effect of Binge Watching on Narrative Engagement and Parasocial Breakups. *Psychology of Popular Media.* Advance online publication, 1-11. https://doi.org/10.1037/ppm0000414

Flayelle, M., Canale, N., Vögele, C., Karila, L., Maurage, P., & Billieux, J. (2019a). Assessing binge-watching behaviors: Development and validation of the "Watching TV Series Motives" and

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"Binge-watching Engagement and Symptoms" questionnaires. *Computers in Human Behavior*, 90, 26–36. https://doi.org/10.1016/j.chb.2018.08.022

Flayelle, M., Maurage, P., Di Lorenzo, K. R., Vögele, C., Gainsbury, S. M., & Billieux, J. (2020). Binge-Watching: What Do we Know So Far? A First Systematic Review of the Evidence. *Current Addiction Reports*, 7(1), 44–60. https://doi.org/10.1007/s40429-020-00299-8

Flayelle, M., Maurage, P., Karila, L., Vögele, C., & Billieux, J. (2019b). Overcoming the unitary exploration of binge-watching: A cluster analytical approach. *Journal of Behavioral Addictions*, 8(3), 586–602. https://doi.org/10.1556/2006.8.2019.53

Hair, J., Babin, B., Anderson, R., & Black, W. (2018). *Multivariate Data Analysis*, 8th edition. Cengage India.

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2010). Methodological paper an assessment of the use of partial least squares structural equation modeling in marketing research. *J. of the Acad. Mark. Sci*. https://doi.org/10.1007/s11747-011-0261-6

Hiller, S., & Walter, J. (2015). No Longer Durable? The Rise of Streaming Music and Implications for the Bundled Album. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2670976

Jenner, M. (2015). Binge-watching: Video-on-demand, quality TV and mainstreaming fandom. *International Journal of Cultural Studies*, 20. https://doi.org/10.1177/1367877915606485

Ke, G. N., & Wong, S. F. (2018). A Healthy Mind for Problematic Internet Use. *Cyberpsychology, Behavior, and Social Networking*, 21(10), 637–645. https://doi.org/10.1089/cyber.2018.0072

Kiattisin, S., & Nitlarp, T. (2022). The Impact Factors of Industry 4.0 on ESG in the Energy Sector. *Sustainability*, 14(15), 9198. https://doi.org/10.3390/su14159198

Liza, L. O., Rusandi, M. A., & Situmorang, D. D. B. (2022). Binge-watching as one of the new emerging behaviors in the COVID-19 era: Is it dangerous? *Journal of Public Health*, fdac071. https://doi.org/10.1093/pubmed/fdac071

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories.

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Behaviour Research and Therapy, 33(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-U

Madison, T. P., Porter, L. V., & Greule, A. (2016). Parasocial Compensation Hypothesis: Predictors of Using Parasocial Relationships to Compensate for Real-Life Interaction. *Imagination, Cognition and Personality*, 35(3), 258–279. https://doi.org/10.1177/0276236615595232

Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, 36(4), 455–470. https://doi.org/10.1016/S0005-7967(97)10031-6

Merikivi, J., Bragge, J., Scornavacca, E., & Verhagen, T. (2020). Binge-watching Serialized Video Content: A Transdisciplinary Review. *Television & New Media*, 21(7), 697–711. https://doi.org/10.1177/1527476419848578

Noh, S. (2021). Dual portfolio management strategies of online subscription video on demand (SVOD) companies: A genre perspective. *Journal of Media Business Studies*, 18(2), 132–153. https://doi.org/10.1080/16522354.2020.1797270

Ort, A. (2021). Is binge-watching addictive? Effects of motives for TV series use on the relationship between excessive media consumption and problematic viewing habits. *Addictive Behaviors Reports*, 13. https://doi.org/10.1016/j.abrep.2020.100325

Ostovar, S., Allahyar, N., Aminpoor, H., Moafian, F., Nor, M. B. M., & Griffiths, M. D. (2016). Internet Addiction and its Psychosocial Risks (Depression, Anxiety, Stress and Loneliness) among Iranian Adolescents and Young Adults: A Structural Equation Model in a Cross-Sectional Study. *International Journal of Mental Health and Addiction*, 14(3), 257–267. https://doi.org/10.1007/s11469-015-9628-0

Panda, S., & Pandey, S. C. (2017). Binge watching and college students: Motivations and outcomes. *Young Consumers*, 18(4), 425–438. https://doi.org/10.1108/YC-07-2017-00707

Perks, L. G. (2019). Media Marathoning and Health Coping. *Communication Studies*, 70(1), 19–35. https://doi.org/10.1080/10510974.2018.1519837

Pittman, M., & Steiner, E. (2019). Transportation or Narrative Completion? Attentiveness during Binge-Watching Moderates Regret. *Social Sciences*, 8(3), 99. https://doi.org/10.3390/socsci8030099

Primack, B. A., Swanier, B., Georgiopoulos, A. M., Land, S. R., & Fine, M. J. (2009). Association Between Media Use in Adolescence and Depression in Young Adulthood. *Archives of General Psychiatry*, 66(2), 181. https://doi.org/10.1001/archgenpsychiatry.2008.532

Raza, H., Yousaf, M., Munawar, R., Sohail, F., Ogadimma, E. C., & Marisa Lim Dao Siang, J. (2021). Investigating Binge-Watching Adverse Mental Health Outcomes During Covid-19 Pandemic: Moderating Role of Screen Time for Web Series Using Online Streaming. *Psychol Res Behav Manag*, 14, 1615-1629. https://doi.org/10.2147/PRBM.S328416

Rubin, A. M., Perse, E. M., & Powell, R. A. (1985). Loneliness, parasocial interaction, and local television news viewing. *Human Communication Research*, 12(2), 155–180. https://doi.org/10.1111/j.1468-2958.1985.tb00071.x

Sackett, A. M., Meyvis, T., Nelson, L. D., Converse, B. A., & Sackett, A. L. (2010). You're Having Fun When Time Flies: The Hedonic Consequences of Subjective Time Progression. *Psychological Science*, 21(1), 111–117. https://doi.org/10.1177/0956797609354832

Shahzad, F., Xiu, G., Shafique Khan, M. A., & Shahbaz, M. (2020). Predicting the adoption of a mobile government security response system from the user's perspective: An application of the artificial neural network approach. *Technology in Society*, 62, 101278. https://doi.org/10.1016/j.techsoc.2020.101278

Shim, H., Lim, S., Jung, E. E., & Shin, E. (2018). I hate binge-watching but I can't help doing it: The moderating effect of immediate gratification and need for cognition on binge-watching attitude-behavior relation. *Telematics and Informatics*, 35(7), 1971–1979. https://doi.org/10.1016/j.tele.2018.07.001

Skues, J., Williams, B., Oldmeadow, J., & Wise, L. (2016). The Effects of Boredom, Loneliness, and Distress Tolerance on Problem Internet Use Among University Students. *International Journal of Mental Health and Addiction*, 14(2), 167–180. https://doi.org/10.1007/s11469-015-9568-8

Song, L., Hu, B., & Mou, J. (2021). Investigating consumer binge-watching behavior: A valence framework perspective. *Journal of Retailing and Consumer Services*, 62, 102604. https://doi.org/10.1016/j.jretconser.2022.103021

Song, L., Zhang, Q., Hu, B, & Mou, J. (2022). To resist or to purchase: The casual mechanism of binge-watching and program purchase, *Journal of Retailing and Consumer Services*, 68, 103021. https://doi.org/10.1016/j.jretconser.2022.103021

Starosta, J. A., & Izydorczyk, B. (2020). Understanding the Phenomenon of Binge-Watching—A Systematic Review. *International Journal of Environmental Research and Public Health*, 17(12), 4469. https://doi.org/10.3390/ijerph17124469

Starosta, J., Izydorczyk, B. & Dobrowolska, M. (2020). Personality Traits and Motivation as Factors Associated with Symptoms of Problematic Binge-Watching. *Sustainability*, 12(4). https://doi.org/10.3390/su12145810

Starosta, J., Izydorczyk, B., & Wontorczyk, A. (2021). Anxiety-Depressive Syndrome and Binge-Watching Among Young Adults. *Frontiers in Psychology*, 12, 689944. https://doi.org/10.3389/fpsyg.2021.689944

Steins-Loeber, S., Reiter, T., Averbeck, H., Harbarth, L., & Brand, M. (2020). Binge-Watching Behaviour: The Role of Impulsivity and Depressive Symptoms. *European Addiction Research*, 26(3), 141–150. https://doi.org/10.1159/000506307

Struk, A. A., Carriere, J. S. A., Cheyne, J. A., & Danckert, J. (2017). A Short Boredom Proneness Scale: Development and Psychometric Properties. *Assessment*, 24(3), 346–359. https://doi.org/10.1177/1073191115609996

Sun, J.-J., & Chang, Y.-J. (2021). Associations of Problematic Binge-Watching with Depression, Social Interaction Anxiety, and Loneliness. *International Journal of Environmental Research and Public Health*, 18(3), 1168. https://doi.org/10.3390/ijerph18031168

Tho, N. D. (2019). Strategic orientations and firm innovativeness: A necessary condition analysis. *Baltic Journal of Management*, 14(3), 427–442. https://doi.org/10.1108/BJM-07-2018-0280

Vaterlaus, J. M., Spruance, L. A., Frantz, K., & Kruger, J. S. (2019). College student television binge watching: Conceptualization, gratifications, and perceived consequences. *The Social Science Journal*, 56(4), 470–479. https://doi.org/10.1016/j.soscij.2018.10.004

Wang, W.-C. (2019). Exploring the Relationship Among Free-Time Management, Leisure Boredom, and Internet Addiction in Undergraduates in Taiwan. *Psychological Reports*, 122(5), 1651–1665. https://doi.org/10.1177/0033294118789034

Whelan, E., Najmul Islam, A. K. M., & Brooks, S. (2020). Is boredom proneness related to social media overload and fatigue? A stress–strain–outcome approach. *Internet Research*, 30(3), 869–887. https://doi.org/10.1108/INTR-03-2019-0112

Wit, L., van Straten, A., Lamers, F., Cuijpers, P., & Penninx, B. (2011). Are sedentary television watching and computer use behaviors associated with anxiety and depressive disorders? *Psychiatry Research*, 186(2–3), 239–243. https://doi.org/10.1016/j.psychres.2010.07.003

Young, K. (1998). Internet addiction: the emergence of a new clinical disorder. *CyberPsychology and Behavior*, 1, 237–244. https://doi.org/10.1089/cpb.1998.1.237

'Are you still watching?' – A study on the predictors of the problematic practice of binge-watching

Appendix 1

Scale	Constructs	Items	Assertives	References
Internet Addiction Test - Young	Problematic Binge-Watching Practice	BW1	I often... believe I spend more time watching series than I should.	Adapted from Young (1998)
		BW2	...I feel depressed, moody, or nervous when I run out of marathon sets, but I feel good as soon as I start a marathon.	
		BW3	I prefer the series' emotion to having intimate moments with my partner.	
		BW4	... My family members complain about the time I spend watching series.	
		BW5	...I try to cut down on the time I spend watching series, but I fail.	
		BW6	... I monitor my series streaming apps to be notified of upcoming releases.	
		BW7	I spend more time doing series marathons than hanging out with other people.	
		BW8	...I block negative thoughts about your life with relaxing thoughts about my favorite shows.	
		BW9	... I look forward to a time when I can do series marathons again.	
		BW10	Life without series to marathon would be boring, empty, and boring.	
		BW11	...I scream or get annoyed if someone gets in my way during a series marathon.	
		BW12	...I try to hide how much time I spend doing series of marathons.	
		BW13	...I get worried about the shows or start fantasizing about them shows when I'm not watching them.	
		BW14	... I say "just one more episode" during series marathons.	

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		BW15	... I neglect my chores in order to spend more time watching series.	
		BW16	... My work and tasks are hampered due to the time I spend doing a series marathon.	
		BW17	... I sleep poorly due to long series of marathons at night, and I feel less productive in developing my activities.	
		BW18	... My performance at work is harmed because of binge-watching.	
Social Interaction Anxiety - SIAS	Social Anxiety	AS1	I prefer to stay at home watching series marathons because... I find it challenging to fit in with the people I relate to.	Adapted from Mattick e Clarke (1998)
		AS2	...I feel uncomfortable when I have to socialize.	
		AS3	... I'm not comfortable meeting people in other places.	
		AS4	... I have difficulty talking to other people.	
		AS5	...I'm afraid of sounding weird when I express myself.	
		AS6	...I have difficulty talking to attractive people of the opposite sex.	
		AS7	...I'm afraid of not knowing what to say in social situations.	
		AS8	...I feel nervous when interacting with people I don't know very well.	
		AS9	...I feel like I'm going to say something shameful whenever I speak.	
		AS10	...I'm afraid of being ignored when I'm in a social group.	
		AS11	... I get tense trying to fit into a group.	
DASS-21	Depression	DE1	I practice binge-watching...when I feel like nothing in my life makes sense.	Adapted from Lovibond e
		DE2	...when I feel incapable of feeling excited about anything else.	

	DE3	... when I feel there is nothing to look forward to in the future.	Lovibond (1995)
	DE4	...when I feel discouraged and depressed.	
	DE5	... when I feel like I cannot experience any good feelings.	
	DE6	... when I find it difficult to do anything else.	
Short Boredom Proneness Scale	Boredom	BO1	I binge watching... when I do not know what to do.	Adapted from Farmer e Sundberg (1986)
		BO2	...because I find it hard to find things to entertain myself.	
		BO3	... because many of the things I need to do are monotonous and repetitive.	
		BO4	...because I need more stimulation to keep me entertained than most people.	
		BO5	... when I don't have the motivation to do most of the things I should.	
		BO6	...because most of the time it's hard for me to find something to do to get me interested.	
		BO7	... because most of the time I just sit around with nothing to do.	
Psi-scale	Parasocial Relationships	PR1	During binge watching...I look forward to watching new episodes of my favorite character.	Adapted from Rubin e Powell (1985)
		PR2	...I feel like if my favorite character appeared in another series, I would watch it.	
		PR3	...I feel that if I could find books, magazines, or additional information about my favorite character, I would buy/read it.	
		PR4	...I miss seeing my favorite character when the season ends.	
		PR5	...I feel like I'd like to meet the actor who plays my favorite character in real life.	
		PR6	...I feel bad for my favorite character if he makes a mistake.	

	PR7	...I find my favorite character attractive.

Appendix 2

CODE USED IN THE STRUCTURAL EQUATION MODELING PHASE

```
library(seminr)
require(seminr)
View(seminr)
measurements = constructs(
  composite("Parasocial Relationships", c("PR1", "PR2", "PR3", "PR4", "PR5", "PR6", "PR7")),
  composite("Social Anxiety", c("SA1", "SA2", "SA3", "SA4", "SA5", "SA6","SA7","SA8", "SA9",
"SA10")),
  composite("Depression", c("DE1", "DE2", "DE3", "DE4", "DE6")),
  composite("Boredom", c("BO1", "BO2", "BO3", "BO4", "BO5", "BO6", "BO7")),
  composite("Binge-Watching", c("BW2", "BW5", "BW12", "BW15", "BW16", "BW17", "BW18"))
)
structure = relationships(
  paths(from = "Parasocial Relationships", to = c("Binge-Watching")),
  paths(from = "Social Anxiety", to = c("Binge-Watching")),
  paths(from = "Depression", to = c("Binge-Watching")),
  paths(from = "Boredom", to = c("Binge-Watching")))
plot(structure)
pls__sem_model=estimate_pls(data=seminr,
                  measurements,
                  structure,
                  inner_weights=path_weighting)
p3=summary(pls__sem_model, theme=t)
print(p3$descriptives,digits=3)
print(p3$reliability,digits=3)
print(p3$validity,digits=3)
print(p3$loadings,digits=3)
print(p3$paths,digits=3)
print(p3$fSquare,digits=3)
print(p3$composite_scores,digits = 3)
plot(pls__sem_model)
p4=bootstrap_model(pls__sem_model,nboot = 388)
s2=summary(p4)
s2$bootstrapped_paths
```

Appendix 3

CODE USED IN THE NECESSARY CONDITION ANALYSIS PHASE

```
library(NCA)
model_1 <- nca_analysis(NCA, c(1:4), 5, bottleneck.x="actual", bottleneck.y="actual", steps=10)
nca_output(model_1, summaries=TRUE, bottlenecks=TRUE, plots=TRUE)
```

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```
        model_2        <-        nca_analysis(NCA,        c(1:4),        5,        bottleneck.x="percentage.range",
bottleneck.y="percentage.range", steps=10)
        nca_output(model_2, summaries=TRUE, bottlenecks=TRUE, plots=F)
        model_3  <-  nca_analysis(NCA,  c(1:4),  5,  test.rep  =  10000,  bottleneck.x="percentage.range",
bottleneck.y="percentage.range", steps=10)
        nca_output(model_3, summaries=TRUE, bottlenecks=TRUE, plots=F, test=T)
```