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Disentangling Technostress in Social Streaming Services: The Impact of Perceived Eustress and Distress on User Participation and Engagement

Completed Research Paper

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Abstract

Technostress resulting from the use of social media and social streaming services is usually associated with negative consequences, such as lower user participation and engagement. This paper, however, finds evidence that the perception of stress in association with the use of social streaming services also positively impacts user participation and engagement by disentangling the concept of stress into eustress and distress. Data from 147 social streaming services users were collected and analyzed with structural equation modeling. The results confirm that perceived eustress positively affects user participation and engagement, while perceived distress decreases user participation and engagement. Separating the concept of user participation and engagement into benign and malicious user participation and engagement reveals that eustress is positively related to benign user participation and engagement, whereas perceived distress is positively associated with malicious user participation and engagement.

Keywords: Technostress, social streaming services, user participation and engagement

Introduction

The rapid advancements in information technology have revolutionized and opened up a wide variety of communication possibilities among users. In contrast to offline communication, information technologies can be used to communicate anytime, anywhere, and with anyone. Particularly, social media play a major part in the revolution of communication. Social media platforms enable users to find connections, empathize with others, and communicate with them. It has become a norm to communicate with one another through various online social platforms with diverse communication structures, which depend on the platform and offered services regarding participation possibilities. Users can actively create content by posting, e.g., videos. In contrast, much more people consume the shared content of others. Soon, social media enabled business models that make their success dependent on the users' amount of participation and engagement (Wasko and Di Gangi 2016). Therefore, practitioners and scholars are interested in detecting the factors influencing user participation and engagement in social media (Giertz et al. 2022; Hilvert-Bruce et al. 2018; Villi and Matikainen 2016).

One crucial factor impacting social media user behavior is technostress (Maier, Laumer, Weinert, et al. 2015). As defined by Brod (1982), technostress is the stress experienced when utilizing information and communication technologies (ICT). The term stress, and therefore also the term technostress, is usually referred to in a negative sense (=distress), leading to adverse outcomes for the individual, such as symptoms

of mental fatigue, depression, or heart diseases (Champion 1988; Maier, Laumer, Eckhardt, et al. 2015; Srivastava et al. 2015). Scholars found that technostress significantly influences users' intentions and behaviors. More specifically, a recently published study analyzed the behavioral consequences of technostress and found that technostress leads to less ICT usage (Schmidt et al. 2021). However, this study is limited to the negative conceptualization of technostress, even though scholars agree that stress can also be positive for the individual (Califf et al. 2020; Lazarus and Folkman 1984). Tarafdar and colleagues attempted to take on a holistic view on technostress by differentiating between distress and eustress (Tarafdar et al. 2019).

Distress is when individuals perceive a situation as stressful due to their belief that environmental demands exceed their capabilities. This perception of distress leads to feelings of overwhelm, helplessness, and apprehension regarding adverse outcomes. The general public has associated stress with this negative view of distress. However, research has revealed that stressors can also be perceived as positive challenges. Eustress perception occurs when individuals appraise a situation as a challenge rather than as a hindrance or threat because they expect that successfully managing the demands will result in favorable outcomes (Cavanaugh et al. 2000). In contrast to distress, eustress has a positive impact, fostering increased motivation, enhanced learning, and improved performance and productivity (Podsakoff et al. 2007; Zhao et al. 2020).

More and more studies follow the advice of including both views on stress by differentiating between distress and eustress associated with ICT use. While there is a plethora of literature examining the dark side of social media use, which leads to techno-distress, a recently published study showed that social media can also be perceived as challenge stressors positively impacting the perception of eustress (Zielonka and Rothlauf 2021). Based on these findings, this article accounts for both social media induced distress and eustress.

Therefore, the objective of this paper is to undertake a comprehensive theoretical derivation and empirical examination of how techno-eustress and techno-distress influence user participation and engagement within the context of social streaming services. Our proposed research model is subjected to empirical validation using data collected from 147 participants through an online survey. These participants were explicitly requested to report on their experiences related to the social streaming services they regularly utilize.

In congruence with previous findings, we state that appraising social media as hindrance stressors positively impacts perceived distress, thus leading to lower user participation and engagement in social streaming services. In contrast, however, we argue that the appraisal of social streaming services as challenge stressors positively affects the perception of eustress. Perceived eustress in association with social streaming services, in turn, leads to higher user participation and engagement in social streaming services. Furthermore, we separate the construct of user participation and engagement into benign and malicious user participation and engagement in social streaming services. We propose that perceived eustress increases benign user participation and engagement, whereas malicious user participation and engagement is positively affected by the perception of distress in association with the use of social streaming services.

Our findings support our hypotheses and advance research in social streaming services by uncovering the potential of eustress to increase user participation and engagement.

The following section highlights related concepts and literature based on which the hypotheses are derived. After that, the methodology is described and followed by the quantitative data analysis performed with structural equation modeling. Based on the analysis, the results are discussed. At the end, we draw conclusions and propose avenues for future research.

Technostress

Even though the common connotation of stress is negative, psychology research proved that there is also a positive side of stress, namely eustress (Selye 1976). The ambivalence of stress mainly stems from the perspective that stress is an ongoing process of transactions between an individual and their environment (Lazarus and Folkman 1984). This view explains why different individuals perceive the same stressor differently or in different intensities. According to this transactional stress model, the individual first needs to appraise a situation or demands as stressors, which can be classified as threat/hindrance stressors and

challenge stressors. Then, the individual evaluates their coping responses in the form of a secondary appraisal. These transactions result in outcomes such as actions or affects (Lazarus and Folkman 1984). Cognitive appraisals are key elements of this model because they explain the perception of the different stress levels. Based on this model, it is on the individual to evaluate if environmental conditions (e.g., social streaming services) are threats in terms of hindrance stressors or are rather appraised as challenge stressors and if the individual has the necessary coping strategies to respond to the stressors successfully. Although most of the literature addresses the adverse effects of stressors and the associated stress (distress), there is a growing number of studies focusing on the positive side of technostress, namely techno-eustress, and providing a holistic view on technostress by accounting for techno-distress and techno-eustress (Califf et al. 2020; Zhao et al. 2020).

Distress refers to the appraisal of stressors as hindrances or threats, resulting in adverse psychological and physiological outcomes (Galluch 2015). In contrast, eustress denotes the appraisal of stressors as challenges, which is associated with positive and affirmative outcomes such as satisfaction, enhanced learning, improved performance, and increased productivity, when having addressed the demands successfully (Califf et al. 2020; Cavanaugh et al. 2000; Podsakoff et al. 2007; Zhao et al. 2020). While the appraisal of challenge stressors and hindrance stressors, and thus, the perception of eustress and distress, are not mutually exclusive, both perceptions can also coexist (Folkman 1997; McGowan et al. 2006).

Stress related to the use of technology is commonly known as technostress (Brod 1982). The concept of technostress explores scenarios where the use of technology triggers stress-related processes (Ragu-Nathan et al. 2008; Tarafdar et al. 2019). Our research focuses on social streaming services as a specific type of information and communication technology (ICT), which can sometimes overwhelm individuals, surpassing their resources and capabilities. When individuals increasingly view technology as a threat, their perception of distress intensifies, resulting in negative emotions and increased strain (Galluch et al. 2015; Tarafdar et al. 2015). Conversely, when individuals regard information and communication technologies as challenges, they are driven to confront these demanding situations, fueled by the anticipation that doing so will yield favorable and affirmative outcomes. These outcomes encompass heightened productivity, enhanced efficiency, and learning (Califf et al. 2020; Cavanaugh et al. 2000; Podsakoff et al. 2007; Zhao et al. 2020). Recent studies have further emphasized the ambivalent nature of technostress perception, where ICT can be seen as both challenge and hindrance stressors. For instance, Califf, Sarker, and Sarker (2020) explored technostress perception in healthcare using a mixed methods approach. Their findings revealed that certain technology characteristics are perceived as challenge technostressors, such as usability and involvement facilitation, and positively impact an individual's positive psychological response. On the other hand, characteristics like unreliability, insecurity, and overload are considered hindrance technostressors and tend to result in a more negative psychological response (Califf et al. 2020).

A qualitative study interrogating entrepreneurs also reports on the beneficial aspects of technology, enabling them to perceive eustress (Heikkila et al. 2015). These results are noteworthy as they underscore the interviewees' recognition that technology can act as a catalyst for co-creation, collaboration, and communication, primarily evoking eustress rather than distress (Heikkila et al. 2015). These technology characteristics are also provided in social streaming services. Another recently published article even proposed and investigated that social media can be perceived by users as both challenge and hindrance stressors, which induces perceived eustress and perceived distress, respectively (Zielonka and Rothlauf 2021). Although research has started to build around the ambivalence of techno-eustress in social media use, there still is a lack of studies examining the specific outcomes of the perception of eustress and distress associated with social streaming services. Based on the knowledge that the perception of technostress, may it be eustress or distress, influences users' emotions, physical state, and behavior (Califf et al. 2020; Tarafdar et al. 2010, 2020), we argue that technostress also impacts user participation and engagement in social streaming services.

Social Streaming Services and User Participation and Engagement

With the advent of social media we face a user generated content culture, where any user can take on the role of a content creator. With a growing bandwidth of networks, user generated content developed from blog posts over picture sharing to video streaming. The number of users of social streaming services has been steadily growing (Degenhard 2021), and nowadays, any user has the opportunity to develop their video content into a valuable online business (Törhönen et al. 2021). Social streaming services refer to online

platforms or applications that allow users to stream or broadcast live video content to an audience in real-time while also providing features for interaction and engagement with other users (e.g., YouTube Live, Twitch, Facebook Live). These platforms enable users to share their experiences, thoughts, or talents, and other users can comment, like, and interact with the streamer, fostering a sense of community and engagement. Hence, social streaming is a very participatory online media due to the various possibilities of social interaction with streamers and other consumers (Sjöblom and Hamari 2017). These characteristics allow users to participate and engage. Therefore, user participation and engagement involves the dimensions of content consumption, creation, or contribution (Schivinski et al. 2016). In this study, we focus on user contributions and creations in response to content provided by streamers since these two dimensions require the user to do something actively and co-create the social streaming experience.

Higher user participation and engagement lead to an increased use of social streaming services (Erlandsson et al. 2016). Due to the value of co-creation in social media platforms, a social streaming service is more valuable the higher the user participation and engagement (Qiu et al. 2015). For instance, studies found evidence that user participation and engagement (e.g., likes, comments) increases the willingness to pay for additional premium content or premium options (e.g., Super Chat or Super Sticker within YouTube Livestream sessions) (Oestreicher-Singer and Zalmanson 2013). Therefore, it is of high interest to examine the antecedents of user participation and engagement in social streaming platforms.

In this study, we operationalize user participation and engagement on social streaming services as a set of measurable actions that users can undertake on social streaming services in response to content provided by creators: reacting to streamed content (e.g., hearts, likes, ratings), commenting on streamed content (e.g. synchronous or asynchronous in Youtube live sessions), sharing and reposting streamed content (e.g. linked Instagram story) (Barger and Peltier 2016).

Previous research already investigated some antecedents of user participation and engagement in social platforms. For example, studies found that altruism, expected relationship, and reciprocal benefit drives user participation and engagement (Hsu and Lin 2020). Liu et al. (2021) showed that authenticity and attitudinal similarity enhance perceived intimacy, which in turn impacts user participation and engagement (Liu et al. 2021). Although increasing user participation and engagement in social streaming services is crucial for creating sustainable value, research is still lacking. In particular, research proves that social media, including social streaming services, are a source of technostress (Maier, Laumer, Weinert, et al. 2015; Zielonka and Rothlauf 2021). At the same time, technostress is known to highly impact user behavior (Srivastava et al. 2015; Tarafdar et al. 2010).

However, there still is a lack of research on how technostress is related to and impacts user participation and engagement in social streaming services. Recently published work uncovered that envy drives technostress perception in association with social media use (Zielonka and Rothlauf 2022). In particular, the authors differentiate between benign and malicious envy and found that benign envy has a motivational character in a way that users who experience benign envy go through the process of eustress due to appraising social media rather as challenge stressors rather than as hindrance stressors. In contrast, malicious envy drives the perception of distress because users appraise social media as hindrance (Zielonka and Rothlauf 2022). Based on these findings, we propose that social streaming services can also be perceived as challenge stressors and as hindrance stressors because social streaming services provide even more opportunities to interact with other users, e.g., through live streaming, instant chats, immediate reactions, and feedback from the community. Therefore, the potential to experience benign or malicious envy is even higher. Hence, social streaming services can be appraised as challenge or hindrance stressors inducing the eustress or distress process, respectively. And since technostress impacts user behavior, we derive that technostress also impacts user participation and engagement in social streaming services.

Hypotheses

Based on the transactional stress model, the same stressor can be appraised as challenge and as hindrance. The stressor is appraised as challenge when the individual expects that tackling the demand, even if it exceeds their resources or capabilities, will result in positive and affirmative outcomes for them, such as success, social rewards, or personal growth (Cavanaugh et al. 2000; Podsakoff et al. 2007). Social streaming services offer a wide range of consuming, creating, and sharing content. Therefore, social streaming services can also be perceived as challenge stressors. For example, when users compare themselves with others, they

might perceive benign envy, which positively impacts the appraisal of social media as challenge stressors rather than as hindrance stressors (Zielonka and Rothlauf 2022). In line with previous studies in the context of social media (Zielonka and Rothlauf 2021, 2022), we propose that social streaming services can be appraised as challenge and as hindrance stressors. Depending on the appraisal of social streaming services as challenge or hindrance, the individual engages in a challenge or a hindrance coping response, respectively. In turn, a challenge coping response induces the perception of eustress in association with social streaming services. Similarly, a hindrance coping response induces the perception of distress in association with social streaming services.

H1: Appraising social streaming services as challenge stressors is positively related to a challenge coping response.

H2: Appraising social streaming services as hindrance stressors is positively related to a hindrance coping response.

H3: The higher the challenge coping response, the higher is the perception of eustress.

H4: The higher the hindrance coping response, the higher is the perception of distress.

According to various studies, techno-distress impacts user behavior, such as discontinuing social media usage (Maier, Laumer, Weinert, et al. 2015; Schmidt et al. 2021). Discontinuing the use of social streaming services is, however, one of the most radical ways of responding to techno-distress. Therefore, we propose that perceiving distress due to the use of social streaming services results in lower user participation and engagement. Since stress research found that eustress provides motivational effects on the individual, we derive that the perception of eustress in association with social streaming services is positively related to user participation and engagement in social streaming services.

H5: The perception of eustress is positively related to user participation and engagement.

H6: The perception of distress is negatively related to user participation and engagement.

The hypotheses H1 to H6 form our research model 1, which examines the impact of the perception of social streaming services as challenge or as hindrance stressors on the perception of eustress and distress, respectively, which in turn influences user participation and engagement (Figure 1).

Although user participation and engagement is a crucial factor for evaluating streaming success, there is user participation and engagement, which is undesirable for both the streamer and other users, such as hate comments or bad ratings. Therefore, separating the general construct of user participation and engagement into the good and the ugly is essential. Hence, we introduce research model 2, which deviates from research model 1 in differentiating between benign and malicious user participation and engagement (Figure 2). In this study, we refer to positive and desirable user participation and engagement as benign user participation and engagement. In contrast, the dark side of user participation and engagement is denoted as malicious user participation and engagement. Knowing that eustress has a motivational character leading to desirable outcomes, we argue that perceived eustress in association with social streaming services positively impacts user participation and engagement, whereas it is negatively related to malicious user participation and engagement.

H7a: The perception of eustress is positively related to benign user participation and engagement.

The perception of distress leads to various adverse outcomes, such as bad emotions, which impact the individual's behavior. Studies found that technostress leads to negative outcomes, such as counterproductivity on the job (Kim and Lee 2021). Hence, we argue that perceived distress in association with social streaming services positively impacts malicious user participation and engagement associated with social streaming services.

H8a: The perception of distress is positively related to malicious user participation and engagement.

Although eustress and distress are not understood as two ends of a continuum and can coincide, they still show bipolar effects (Russell 2017). Therefore, we expect that perceived eustress negatively impacts malicious user participation and engagement and that perceived distress negatively impacts benign user participation and engagement.

H7b: The perception of eustress is negatively related to malicious user participation and engagement.

H8b: The perception of distress is negatively related to benign user participation and engagement.

Figure 1 and Figure 2 summarize and graphically display the derived research models in the context of social streaming services.

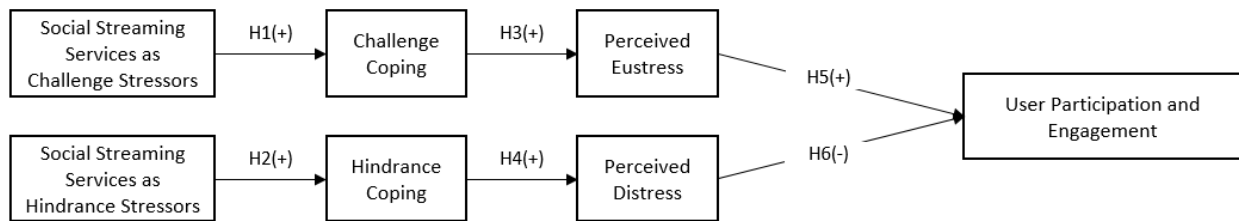


Figure 1. Research model 1

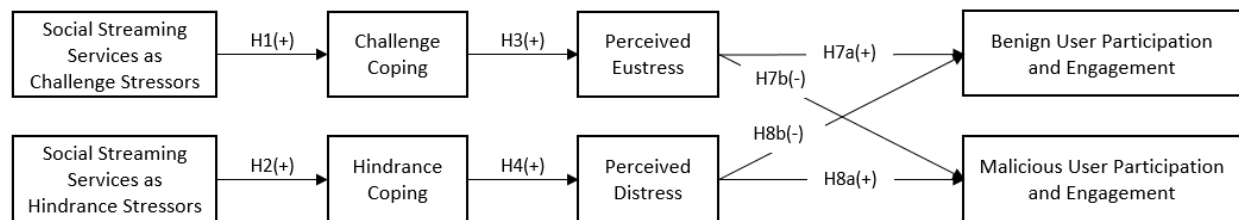


Figure 2. Research model 2

Method

The research model was empirically tested using a field study for data collection. Structural equation modeling was applied for statistical analysis.

Data Collection

We gathered data from 147 individuals who are active users of social streaming services through an online survey. To reach our target participants, we distributed our participation request on platforms like Instagram and Facebook while also enlisting the help of friends, colleagues, and acquaintances to share and disseminate the survey link via social media. Our research aimed to encompass a broad and diverse range of participants, spanning different professions, age groups, and other demographics, as we sought to comprehensively analyze and understand the holistic technostress process among general social media users.

Nevertheless, we ensured the sample's representativeness concerning the level of social media usage because the impact of social streaming services as stressors is dependent on the extent of use. Therefore, we screened participants based on their daily hours of social media engagement and excluded individuals who did not use social streaming services for a minimum of one hour per day.

Measures

Given the limited research on eustress perception within the realm of social streaming services, we found it necessary to adapt and modify validated scales to suit the specific context of social streaming services and the measurement of eustress related constructs. To assess how and to what degree the participants perceive

social streaming services as challenge and hindrance stressors, we adapted scales originally developed by Searle and Auton (2015). Additionally, we incorporated reflective items for perceived eustress and perceived distress, drawing from the work of Branson et al. (2019) and O'Sullivan (2011). The measurement of user participation and engagement was based on Barger and Peltier (2016). For the validation of all the constructs used in our study, we conducted a factor analysis, which confirmed that the items reflected the constructs, with factor loadings consistently exceeding 0.7.

All of the items in our questionnaire were measured using a seven-point Likert scale, ranging from 1, signifying "I strongly disagree," to 7, representing "I strongly agree." To ensure the questionnaire's face validity, we sought feedback from five individuals who reviewed and tested it before its official release. Furthermore, we gathered supplementary data on control variables, including gender, age, average daily usage of social streaming services in hours, profession, and highest level of educational qualification.

Data Analysis

We employed structural equation modeling (SEM) to analyze the collected data and assess the hypotheses we formulated. Given that techno-eustress, especially in the context of social streaming services, remains a relatively unexplored area in research (Tarafdar et al. 2019), our study takes on an exploratory nature. Scholars have recommended using partial least squares structural equation modeling for analyzing such contexts (Chin and Newsted 1999). We followed the guidelines outlined by Hair et al. (2017) to determine the minimum sample size. We successfully gathered and analyzed 147 fully completed questionnaires, all meeting the established criteria. Among these 147 respondents were 80 females and 67 males, with no respondents falling into other categories. The age of the respondents ranged from 17 to 74 years, and their average daily usage of social streaming services per person varied from 1 hour to 8 hours.

Measurement Model

In the initial stage of our analysis, we conducted a confirmatory factor analysis for the measurement model. All items exhibited factor loadings exceeding 0.7 for each respective factor. Furthermore, we assessed the reliability and validity of the constructed measures following the approach outlined by Roldán and Sánchez-Franco (2012). Table 1 provides evidence supporting the validity of our constructs, as the average variance extracted (AVE) for all constructs surpasses the threshold of 0.5, which is in line with the criteria established by Fornell and Larcker (1981). We calculated composite reliability and Cronbach's Alpha to ensure the measures' reliability. Importantly, all values exceeded the requisite threshold of 0.6, confirming the reliability of our construct measurements. The results of the Fornell-Larcker criterion test, presented in Table 2, demonstrate the discriminant validity. All measures meet the required criteria (Fornell and Larcker 1981).

	Average Variance Extracted	Cronbach's Alpha	Composite Reliability
Social Streaming Services as Challenge Stressors	0.640	0.920	0.934
Social Streaming Services as Hindrance Stressors	0.662	0.943	0.951
Challenge Coping	0.692	0.851	0.900
Hindrance Coping	0.783	0.729	0.878
Perceived Eustress	0.600	0.766	0.818
Perceived Distress	0.616	0.930	0.941
User Participation and Engagement	0.608	0.785	0.861
Benign User Participation and Engagement	0.672	0.755	0.859
Malicious User Participation and Engagement	0.723	0.809	0.886

Table 1. Validity and reliability statistics of the measurement model

	Social Streaming Services as Challenge Stressors	Social Streaming Services as Hindrance Stressors	Challenge Coping	Hindrance Coping	Perceived Eustress	Perceived Distress	User Participation and Engagement	Benign User Participation and Engagement	Malicious User Participation and Engagement
Social Streaming Services as Challenge Stressors	0.800								
Social Streaming Services as Hindrance Stressors	0.134	0.814							
Challenge Coping	0.770	0.232	0.832						
Hindrance Coping	0.062	0.751	0.209	0.885					
Perceived Eustress	0.571	0.153	0.745	0.197	0.774				
Perceived Distress	0.163	0.810	0.279	0.695	0.182	0.796			
User Participation and Engagement	0.372	-0.131	0.360	0.008	0.462	-0.046	0.780		
Benign User Participation and Engagement	0.330	-0.114	0.327	0.028	0.434	-0.012		0.820	
Malicious User Participation and Engagement	0.036	0.213	0.039	0.098	0.118	0.296		0.188	0.850

Table 2. Fornell-Larcker Criterion Test Results

	Challenge Coping	Hindrance Coping	Perceived Eustress	Perceived Distress	User Participation and Engagement	Benign User Participation and Engagement	Malicious User Participation and Engagement
Social Streaming Services as Challenge Stressors	1.000						
Social Streaming Services as Hindrance Stressors		1.000					
Challenge Coping			1.000				
Hindrance Coping				1.000			
Perceived Eustress					1.033	1.034	1.034
Perceived Distress					1.033	1.034	1.034

Table 3. Variance Inflation Factors

Structural Model

We assessed the structural model for multi-collinearity by examining the variance inflation factor (VIF). As illustrated in Table 3, all VIF values fall below the threshold of 3, signifying the absence of multi-collinearity among the constructs (Jagpal 1982; Salmerón Gómez et al. 2016). In order to test the structural model, we applied partial least squares structural equation modeling. Figure 3 and Figure 4 show the models, including their path coefficients and the associated significance levels for the hypotheses we proposed, respectively. Altogether, most of the hypotheses can be confirmed at the significance level of $p < 0.001$, indicating support for those hypotheses.

The test results reveal that appraising social streaming services as challenge stressors positively impacts challenge coping response (H1). Furthermore, the higher the challenge coping response of the individual is, the higher is the perception of eustress (H3). On the contrary, appraising social streaming services as hindrance stressors fosters a hindrance coping response (H2), which in turn positively impacts the perception of distress (H4). According to the analysis, perceived eustress significantly enhances user participation and engagement in social streaming services ($p < 0.001$) (H5). In contrast, perceived distress negatively affects user participation and engagement in social streaming services (H6). However, this correlation can only be confirmed at a significance level of $p < 0.01$. The total percentage of variances explained is 23.1% for user participation and engagement in social streaming services.

Disentangling the concept of general user participation and engagement and separating it into benign and malicious user participation and engagement in social streaming services reveals even more about the hypothesized relationships (Figure 4). The perception of eustress clearly positively impacts benign user participation and engagement in social streaming services (H7a). However, the perception of eustress does not have any significant impact on malicious user participation and engagement in social streaming services (H7b). In contrast, the perception of distress is positively related to malicious user participation and engagement in social streaming services (H8a), whereas it does not have any significant impact on benign user participation and engagement in social streaming services. To conclude, the quantitative analysis of our study largely backs our theoretical deduction and the resulting hypotheses.

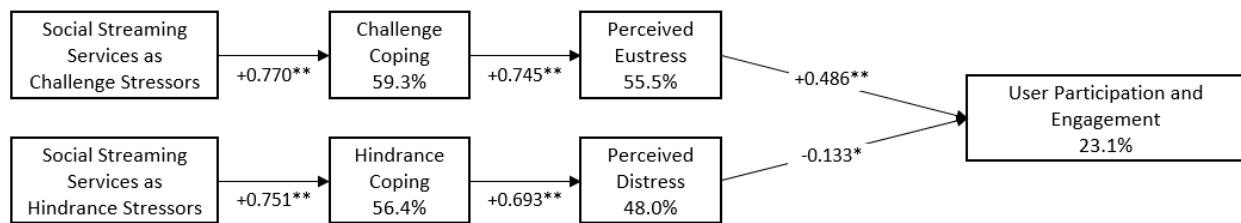


Figure 3. Results of the Structural Model 1 ** $p < 0.001$, * $p < 0.01$



Figure 4. Results of the Structural Model 2 ** $p < 0.001$, * $p < 0.01$

Discussion and Implications

Overall, the data analysis predominantly confirms our hypothesized research model. First, our study shows that social streaming services can be appraised as challenge stressors and hindrance stressors. Depending on this appraisal, the technostress process is induced: when the user appraises social streaming services as challenge stressors, the user engages in a challenge coping response, which in turn leads to the perception of eustress. In contrast, appraising social streaming services as hindrance stressors positively impacts a hindrance coping response, which in turn leads to the perception of distress. These findings align with previous literature investigating these relationships within the context of classic social media use (Zielonka and Rothlauf 2021, 2022). The most important results of this study for researchers and practitioners are the relationships between eustress, distress, and user engagement and participation. In particular, perceived eustress is a significant contributor to user participation and engagement, meaning that the higher the perception of eustress due to the use of social streaming services is, the more users participate and engage in those social streaming platforms. In contrast, distress is negatively impacting user participation and engagement.

Even though user participation and engagement is most often treated as a positive factor in social streaming services, there are also studies revealing the bad side of user behavior on social media and social streaming services. Therefore, we split user participation and engagement into the good and the bad and found that eustress positively impacts benign user participation and engagement. Whereas distress positively impacts malicious user participation and engagement. Hence, in order to increase user participation and engagement, which is known to be a key factor for value creation, social streaming services providers, streamers, and users should try to provide an environment where users rather perceive eustress than distress.

Conclusions and Outlook

This study aimed to introduce a holistic view of technostress in association with social streaming services and to uncover the impact of the technostress process on user participation and engagement. We are the first to disentangle technostress by providing a holistic conceptualization of the technostress process with its both sides, distress and eustress, and to uncover their impact on user participation and engagement in social streaming services. In addition, we also disentangled the construct of user participation and engagement by separating it into benign and malicious user participation and engagement. Our empirical research results confirm that appraising social streaming services as challenge stressors induces the eustress process, positively impacting user participation and engagement. In contrast, appraising social streaming services as hindrance stressors induces the distress process within the user, which negatively impacts user participation and engagement. Furthermore, we found that the eustress process contributes to benign user participation and engagement, whereas the distress process rather leads to malicious user participation and engagement.

Given that, this study is one of the first ones to introduce the holistic view on technostress in social streaming services, we wanted to provide a general model which future studies can build upon. As this study does not differentiate between consumers and streamers but rather looks at all users of social streaming services, future studies should examine if there are behavioral differences between consumers and streamers regarding technostress and the impact on user participation and engagement. In addition, it would be of interest to look at the differences in technostress antecedents and outcomes of the technostress process by types of media, for example, differentiating between live streaming and on-demand streaming. Overall, we believe this study provides important contributions to practice and research and encourages researchers to take on the holistic view on technostress when examining social streaming services.

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Appendix

A list of the items queried in the survey is provided in the following.

Social streaming services and their contents...

Social Streaming Services as Challenge Stressors	help me learn a lot.
	show me that I can do something new.
	inspire me.
	encourage me.
	motivate me.
	provide me with the opportunity to improve my skills.
	open up new points of view for me.
	provide me with new perspectives.
	bring me new ideas.
help me be more efficient.	
Social Streaming Services as Hindrance Stressors	hinder all the successes I could have.
	limit my possibilities.
	restrict how well I can work.
	hinder me from accomplishing difficult tasks.
	lower my productivity.
	make me feel overwhelmed with the demands of life.
	make me dissatisfied with my situation.
	put me under pressure to keep up.
	block me from doing something.
make me lose control over my time.	

Challenge Coping	Due to content on social streaming services, I set goals for myself.
	Due to content on social streaming services, I work on myself more.
	Other people on social streaming services motivate me to try new things.
	I draw strength and motivation from comparing myself to others on social streaming services.
	By sharing my accomplishments on social streaming services, I hold onto my goals more firmly.
	I share my life on social streaming services to hold myself accountable to my resolutions and achieve my goals.
Hindrance Coping	I actively distract myself from the content of social streaming services.
	I make sure not to spend too much time on social streaming services.
	I control how much time I spend using social streaming services.
	I intend to spend less time on social streaming services.
	I ignore content of social streaming services.
I do not engage further with content of social streaming services.	

Perceived Eustress	I can effectively deal with stressful changes.
	I successfully handle annoying problems.
	Stress positively contributes to my ability to handle problems.
	I generally feel motivated by stress.
	I can successfully deal with irritations.
	I can successfully complete tasks under pressure.
	Pressure increases my productivity.
	When I am under pressure, I perform better.
	I feel in a flow state, so I am motivated to work towards my goals.
	I feel motivated under pressure.
	The results of my activities are worth the effort.
	I am satisfied with how I handle pressure.
	I am proud to be able to handle pressure.
	I feel determination and resolve.
Perceived Distress	I feel drained by my activities.
	Under pressure, my mind gets out of control.
	The use of social streaming services is a burden for me.
	I feel burnt out.
	I find it difficult to focus on my goals.
	I am frustrated with myself.
	The pressure to keep up exhausts me.
	I feel overwhelmed.
	I feel overwhelmed by demands.

How do you typically react to content on social streaming services?

When I like the content on social streaming services, then...

Benign User Participation and Engagement	I like the content (e.g., thumbs up).
	I share the content or forward it.
	I comment positively on the content.
	I send positive emojis.
	I make content on the same topic.

When I do not like the content on social streaming services, then...

Malicious User Participation and Engagement	I dislike the content (e.g., thumbs down).
	I share the content or forward it with my negative comment or criticism.
	I comment negatively on the content.
	I send negative emojis.
	I make content on the same topic and vent my frustration.