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Information overload and fake news sharing: A transactional stress perspective exploring the mitigating role of consumers' resilience during COVID-19

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ARTICLE INFO

Keywords:

Consumers' resilience
Fake news sharing
Information overload
Transactional stress process
Stressor-strain-outcome model

ABSTRACT

The spread of fake news in social networks has become a major concern for various sectors of society, including retail and service providers, some of whom have suffered from decreasing sales due to misinformation consumers shared online. The current COVID-19 crisis has added to the surrounding hysteria, as fake news during crises can heighten negative behavioural responses in consumers, such as irrational panic buying or taking false medical precautionary measures. In fact, driven by the ubiquitous social media landscape, the dissemination of misinformation and the overarching overabundance of information have been major challenges of the pandemic. Given that current research offers little insight into the processes behind the sharing of fake news among consumers and that research on consumer-centred mitigating mechanisms is missing, this study explores the relationship between information overload, fake news sharing, and the overlooked concept of consumers' resilience as a potential shield as viewed through the lens of the current crisis. Structural equation modelling is applied to cross-sectional data from 241 social media users. Drawing from theories of transactional stress and psychological resilience, it is demonstrated that information overload leads to an increased likelihood of fake news sharing by increasing consumers' psychological strain. Furthermore, the study shows that consumers' resilience has the power to mitigate the drastic effects of this negative chain of influence by inhibiting each of the processual components. The results have important implications extending beyond crises. Measures should be taken to enhance consumers' resilience amidst technology-induced stressors while altering the information environment confronting consumers.

1. Introduction

Social media has become one of the defining technologies of our time (Appel et al., 2020). A quick and cost-efficient tool for sharing news and updates with a large audience (Henning-Thurau et al., 2010), it has drastically transformed how information is exchanged and assimilated among consumers (Naeem, 2021). The benefits of social media have become particularly evident during the ongoing COVID-19 crisis and its pandemic restrictions (Sheth, 2020), as social media is the predominant method of maintaining personal connections (Liu et al., 2021) and accessing information (Laato et al., 2020b). However, increased social media consumption has also exacerbated the negative aspects of increased social media use (Sheth, 2020).

Scholars refer to these negative aspects as the 'dark side' of social media and acknowledge that they bring substantial threats to the well-being of consumers (Dhir et al., 2018; Talwar et al., 2019). Excessive

internet and social media use has been associated with problems such as social media fatigue (Dhir et al., 2018, 2019), stalking (Dhir et al., 2021; Kaur et al., 2021), the fear of missing out (Przybylski et al., 2013), problematic sleep (Evers et al., 2020; Tandon et al., 2020; Dhir et al., 2021), perceived overloads (Zhang et al., 2016), cyber-slacking (Nusrat et al., 2021), compulsive social media use (Tandon et al., 2020; Dhir et al., 2021), and the dissemination of fake news (Talwar et al., 2019, 2020a). The latter is of particular concern for society (Talwar et al., 2020a) because not only does it have profound individual, but also political (Allcott and Gentkow, 2017), economic (Clarke et al., 2020), and financial (Visenti et al., 2019) consequences.

Fake news refers to fabricated news stories presented as if from legitimate sources (Lazer et al., 2018). While the problem of fake news on social media is not new (Talwar et al., 2019, 2020a), the outbreak of the 2019 coronavirus has contributed even more to the surrounding hysteria (Pennycook et al., 2020). One alarming aspect specific to the

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<https://doi.org/10.1016/j.jretconser.2021.102555>

Received 15 October 2020; Received in revised form 25 February 2021; Accepted 26 March 2021

Available online 12 April 2021

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pandemic is that misinformation regarding COVID-19 can have disastrous effects on consumers' behavioural choices and even pose serious threats to consumers' health, such as the false proposal that ingesting disinfectant can protect against COVID-19 (Zarocostas, 2020). Moreover, online misinformation has caused consumers to overreact and display unusual retail behaviour, such as hoarding toilet paper, hand sanitizer, and food (Laato et al., 2020a; Naeem, 2021), which has drastic effects on manufacturers, retailers, wholesalers (Sharma et al., 2020), and e-commerce platforms worldwide (Tran, 2021). Even before COVID-19, many retailers and manufacturers felt the negative effects of social media frenzies (despite some firms reportedly capitalising on them to thrive (Luca and Zervas, 2016)), such as when a viral rumour falsely accused McDonald's of using ground worms as a filler in its burgers, causing consumers to boycott the fast-food chain (Taylor, 2016).

The concern over fake news is aggravated by the fact that it spreads faster and wider than fact-based news (Vosoughi et al., 2018) and that corrective measures (e.g., countering rumours by spreading accurate information) are typically ineffective (Appel et al., 2020). Consequently, policymakers and companies have a vested interest in tackling fake news right from the start – that is, preventing consumers from sharing it all, whether deliberately or by mistake (Talwar et al., 2019).

To address this issue, it is essential to understand why consumers are willing to share fake news in the first place; that is, it is necessary to understand why consumers refrain from verifying information before sharing it (Talwar et al., 2019; Laato et al., 2020b). Steps to prevent the spread of fake news could then be examined.

While some academic research on the reasons for sharing fake news has taken place, with some having explored underlying drivers such as online trust, internet experience, or expected social benefits (Khan and Idris, 2019; Talwar et al., 2019; Kozinets et al., 2020), evidence on the intervening mechanisms in consumers' fake news sharing processes is missing (Appel et al., 2020). Most of the previous prevention literature focused on technical specifications, such as algorithm-based debunking and correcting of misinformation (Bode and Vraga, 2018; Chan et al., 2017), rather than the consumer as the fake news sharer. Moreover, concrete studies on fake news sharing during a disruptive event like the COVID-19 pandemic are rare, although there is reason to believe that consumers' behaviour changes during crises due to extensive stressors (Talwar et al., 2021). Only recently has empirical evidence been produced that points out that the online information environment during COVID-19 might impact consumers' unverified news sharing behaviour (Laato et al., 2020b).

Undeniably, the COVID-19 outbreak has been accompanied by an exceptional 'infodemic', that is, an overabundance of information, both true and false, that consumers are confronted with via social media (World Health Organization, 2020). Such information overload is a critical stressor associated with social media consumption outlined in technostress research (Zhang et al., 2016). Not only does it negatively affect consumers' mental health, but it also fosters negative behavioural responses (Luqman et al., 2017). The Director-General of the World Health Organization declared, "We're not just fighting an epidemic; we're fighting an infodemic". Nonetheless, the question of how this information overload might contribute to fake news sharing remains. Moreover, it is particularly important to explore how consumers can become resilient to such information-related stress.

Resilience is generally defined as humans' ability to bounce back and positively adapt in the face of adversity or significant sources of stress (Windle, 2011). It acts as a major preventive mechanism during times of stress and the subsequent negative outcomes. Strikingly, this construct has only recently begun to garner interest in the consumer realm (Bermes et al., 2020), even though resilience has long been known as an effective buffer against stress in adjacent research fields, such as psychology (Davis et al., 2009) and management (Kossek and Perrigino, 2016). Previous information system research has suggested that consumers' resilience could also play an important role in mitigating

technostress-induced situations (Bermes and Gromek, 2021) (which the social media-induced infodemic resembles), but concrete empirical evidence for resilience as a shield against such consumption-related stress and subsequent negative outcomes is still missing.

Given all this, it appears that significant research gaps still exist regarding (a) the reasons and concrete processes leading to fake news sharing, (b) ways to prevent fake news sharing from a standpoint that focuses on the consumer as the fake news sharer, and (c) the potential mitigating influence of consumers' resilience. Thus, the current study examines consumers' fake news sharing behaviour by drawing on the transactional theory of stress (Lazarus, 1993) applied using the stressor-strain-outcome model (Koeske and Koeske, 1993) and combining it with the psychological resilience theory (Richardson, 2002), using the current COVID-19 crisis as an example. The research aim is to observe how information overload contributes to consumers' fake news sharing behaviour and whether resilience might be a preventative mechanism for such behaviour. To test the proposed relationships, data collected from 241 social media users is analysed.

The first salient contribution of this research is to expand the existing literature on reasons for sharing fake news by examining the phenomenon from a transactional stress perspective. Therein, the study followed Dhir et al.'s (2021) recommendation to comprehensively assess the outcomes of increased social media consumption during the pandemic with emphasis on its dark side by utilising theories from interdisciplinary literature, such as the stressor-strain-outcome model. Second, the study advanced the literature on the prevention of fake news sharing by being among the first to focus on consumer behaviour and introduce the concept of resilience as a mitigating mechanism in the consumer realm, thereby meeting both the requests of Laato et al. (2020b) and Simonson (2015), which are to identify mechanisms preventing the dissemination of unverified information and to integrate new constructs into consumer studies, respectively. The findings will prove useful for policymakers, organisations, marketers, retailers, social media providers, and alike in more than just the context of the ongoing crisis (Grover et al., 2019; Visentin et al., 2019). The article provides guidance for practitioners on how to alter the critical information environment (e.g., how to reduce information overload) or how to strengthen consumers' resilience in the face of social media-induced stress (e.g., by strengthening the protective resilience factor).

The remainder of this paper is structured as follows. The next section discusses why fake news in the context of COVID-19 is particularly critical. Then, it is elaborated how information overload drives the probability of fake news sharing and why consumers' resilience has the power to mitigate it. Subsequently, the hypotheses are tested empirically and the results are discussed before the study's theoretical and practical implications are presented. The paper concludes with the study's limitations and avenues for future research as well as a conclusion.

2. Research background and hypotheses development

2.1. Fake news and the COVID-19 infodemic

Fake news is "fabricated information that mimics news media content in form but not in organisational process or intent" (Lazer et al., 2018, p. 1094). Fake news overlaps with other information disorders, such as misinformation (false or misleading information) and disinformation (false information that is purposely spread to deceive consumers) (Lazer et al., 2018). Although some deem the term fake news inadequate since political debate often resorts to labelling opposite news as unreliable or fake (Cinelli et al., 2020), it will, following Lazer et al. (2018), be retained due to its value as a scientific construct and noteworthy organisational salience. Specifically, consumers' sharing of fake news is considered to be the sharing of intentionally false, realistic, and fabricated stories that could be verified but are not (Visentin et al., 2019): that is, consumers' sharing of unverified information (Laato et al., 2020b; Talwar et al., 2019). Therefore, this article uses fake news

as the umbrella term for all misinformation circulated deliberately or unintentionally about COVID-19.

While fake news sharing has become rampant in today's digital world, the spread of fake news during crises can be particularly dangerous because misinformed behaviours can amplify the magnitude of the crisis, endangering public well-being and negatively influencing consumers' behavioural responses. For example, the false rumour that consuming toxic methanol eliminates the coronavirus, which has been making its rounds on social media, saw over 700 Iranians killed between February and April 2020 (AP News, 2020). Also, as mentioned above, the supply chains struggled to keep up because the COVID-19 crisis fostered panic buying (Aull et al., 2020), driven by photos on social media showing empty supermarket shelves (Naeem, 2021).

Via the Internet, and social media specifically, consumers can access and share an ever-rising quantity of information (Appel et al., 2020). While online websites as news sources can be distinguished from social media as news sources, website news is typically shared via social media (Islam et al., 2020), which makes social media an amplifier of information, both real and fake (Allcott and Gentzkow, 2017). COVID-19 has further increased consumers' social media consumption, leading to an enormous amount of word-of-mouth data about the virus (Sheth, 2020). It has also been observed that many consumers consider social media as their primary news source when seeking COVID-19 information (Apuke and Omar, 2020). Yet, the availability of information does not correlate with consumers' increased knowledge, as the high quantity of information is often unreliable and of questionable accuracy (Appel et al., 2020), leading to an excess of fake news consumption (Islam et al., 2020).

A significant number of resources have been directed to ensure the availability of reliable information about COVID-19, to curb the spread of misinformation, and to provide consumers with sound behavioural advice (Zarocostas, 2020). For instance, search and media companies such as Google and Facebook counter the spread of rumours by placing information centres at the top of their newsfeeds, and CEOs of large retail chains have directly spoken to consumers online to discourage panic buying and hoarding (Aull et al., 2020). Nonetheless, the information environment during COVID-19 is characterised by a high proportion of misinformation, poor content structure, irrelevance of news articles, and generally an overabundance of information fuelled by social media (Laato et al., 2020b) and by the novelty, rapid development, and unpredictability of the pandemic (Islam et al., 2020). Previous work has highlighted that the so-called infodemic has stressed consumers out, endangered their well-being, and contributed to cyberchondria and anxiety (Laato et al., 2020a, 2020b; Liu et al., 2021).

The overabundance of information on COVID-19 on social media is also reminiscent of a critical stressor drawn from technostress research, namely, information overload (Zhang et al., 2016). In fact, technostress research, which is research that investigates technology-induced stress processes (Ayyagari et al., 2011), has shown that perceived information overload in social media not only negatively influences consumers' well-being but also increases the probability of negative behavioural responses (Luqman et al., 2017). Therefore, in what follows, the relationship between information overload and fake news sharing will be explored by applying the well-founded transaction-based model of technostress.

2.2. Transactional perspective on stress leading to the sharing of fake news

The transaction-based model of stress with its three focal components, namely, stressor, strain, and outcome, explains the phenomenon of (techno)stress as a transactional process and a corresponding misfit between stressors accompanied by psychological strains and negative behavioural outcomes (Ayyagari et al., 2011). Specifically, stressors constitute the technology-induced stimuli that consumers encounter, strain is the emotionally stressed state that consumers develop, and

outcomes are the behavioural responses to strain (Ragu-Nathan et al., 2008).

In social media and its network of services, overload perception or the consumer's evaluation that the number of demands from the environment exceeds one's ability to tackle them (Saegert, 1973) is known to be a major stressor. In the context of a crisis in the digital era, information overload will act particularly as stressor given the current global reach and constant inflow of information via advanced technology (Gao et al., 2020). Herein, information overload refers to a condition in which the volume of novel information exceeds the consumers' capacity to process in a certain unit of time (Zhang et al., 2016). In line with the understanding of stress as a transactional process, information overload should immediately predict psychological strain due to the inherent misfit in perception between the technology-induced demand (that is, the continuous inflow of information) and consumers' perceived coping abilities.

Such strain includes feelings of fatigue (Zhang et al., 2016), information anxiety (Wurman, 1989), and invasion (Ayyagari et al., 2011). Against the background of the current technology-induced information overload and its disruptive effects and drawing on the definition of technostress, this article refers to these feelings as information strain; that is, consumers' aversive feeling that their personal lives are being invaded by COVID-19 information (Ayyagari et al., 2011).

When consumers are under strain, they are known to adopt coping strategies to find relief and avoid such unpleasant feelings (Luqman et al., 2017). In the context of overload specifically, information strain can trigger the evolutionary instinct to retreat to a safer ground, away from the difficult-to-conceptualise information (Laato et al., 2020b). Once consumers feel stressed from a mass of information, their motivation to make sense of new information is reduced, and they recoil from exerting extra effort to verify it (Whelan et al., 2020). This suggests that consumers with greater information strain are more likely to share fake news.

Prior empirical evidence on fake news sharing during the ongoing COVID-19 pandemic is scarce. However, drawing on the theory of cognitive load, Laato et al. (2020b) have indeed recently found that perceived information overload is a strong predictor of unverified information sharing during the COVID-19 pandemic. Moreover, earlier research revealed a positive relationship between information-induced stress and fake news sharing during other crises (Huang et al., 2015). Given the preceding discussion, the following hypotheses are put forward:

H1. Consumers' perceived information overload fosters information strain.

H2. Information strain increases the probability to share fake news.

Support for these hypotheses (H1 and H2) would constitute evidence that the volume of information sharing during crises and beyond is an optimisation, rather than a maximisation, problem. Moreover, confirmation of the relationship between stressor, strain, and outcome (and thus confirmation of adjacent extant research, e.g., Dhir et al., 2018, 2019) provides the basis for the subsequent examination of consumers' resilience within the stressor-strain-outcome model.

2.3. Consumers' resilience as a mechanism of prevention

The concept of resilience is derived from the Latin word 'resilire' meaning to jump back or rebound (Smith et al., 2008). It is best exemplified by a metaphor about metals bending and bouncing back (not breaking) when stressed (Lazarus, 1993). The concept of resilience has become increasingly prominent in the last few decades in different communities of practice (Fletcher and Sarkar, 2013; Keck and Sakdapolrak, 2013), yet surprisingly, research in the consumer realm is scarce (Bermes et al., 2020). This scarcity is striking, as resilience has long been identified as an effective buffer against adversity in adjacent fields of

research (particularly psychology). Such adversity not only comprises major disasters (Windle, 2011) but also modest disruptions embedded in consumers' everyday lives (Moschis, 2007), such as manifold digital stressors (Weinstein and Selman, 2016).

Prior research has unveiled many dark sides of social media (Dhir et al., 2018, 2019; Talwar et al., 2019; Tandon et al., 2020), which draws particular attention to the relevance of the construct of resilience. In particular, resilience is considered to be essential as it can partly be learned (Masten, 2001). In concert with the request that resilience researchers outline their notion of adversity (Luthar et al., 2000), this study especially examines consumers' resilience as the ability to bounce back and positively adapt in face of the information-related stress process.

Herein, drawing on the psychological resilience theory, it is assumed that a consumer's resilience has different protective mechanisms (Rutter, 1987) and impacts the stressor-strain-outcome model at various points (Lazarus, 1993). First, a consumer's resilience entails the ability to bounce back. Consumers with high resilience should thus appraise stressors as less harmful and experience them at a lower level because they can resist stress factors and perceive them as less troublesome (Fletcher and Sarkar, 2013). Accordingly, a consumer's resilience should negatively affect information overload. Second, from the perspective of resilience theory, a stressed state, such as experiencing information strain, can be classified as a disequilibrium or disruption in homeostasis following stress (Richardson, 2002). Given that resilience generally entails the ability to restore a stable equilibrium (Bonanno, 2004), it is assumed that a consumer's resilience directly decreases information strain, which implies that highly resilient consumers should feel less invaded by a mass of information in the long run. Consequently, the probability of fake news sharing should ultimately decrease when its antecedents are mitigated.

Additionally, consumers' resilience directly prevents fake news sharing by endowing the consumer the ability to positively adapt. In the stressor-strain-outcome model, adaptation is reflected in the outcome variable. The literature on psychological resilience suggests that consumers with high levels of resilience show high levels of energy and can detach and conceptualise problems (Block and Block, 1980). Accordingly, resilience is not about the evasion of a stressor but rather successful engagement with it (Rutter, 1987). Therefore, highly resilient consumers should engage in problem-focused acts to minimise negative stressor-strain effects, which implies that they take the time to deal with the stressor, critically question circulated information, and, consequently, are less likely to share fake news. Thus, the following hypotheses are proposed:

H3. Consumers' resilience directly inhibits consumers' perceived

information overload.

H4. Consumers' resilience directly inhibits information strain.

H5. Consumers' resilience directly inhibits the probability to share fake news.

Collectively, support for these hypotheses (H3, H4, and H5) would constitute evidence for the mitigating effects of consumers' resilience in the technology-induced stress process. Fig. 1 summarises the research model and the hypotheses.

3. Empirical study

3.1. Data collection

To test the hypotheses, an empirical study was conducted with social network users recruited via an online consumer panel in Germany during the early stages of the COVID-19 pandemic. A questionnaire was designed based on validated scales and was distributed to social network users only. Particularly, the data were collected via a leading German online panel provider. It was explicitly avoided to use a student sample in order to add external validity and generalisability. The specific panel provider was chosen because it is known to place great emphasis on panel quality, both regarding the recruitment of new panellists and daily panel management. To prevent repeated responses, duplicate checks were integrated to recognise and eliminate participants with similar IP addresses and identical browser configurations. Moreover, high quality participants in the study were assured by performing speed checks, plausibility checks, variance checks, and consistency checks.

The data collection process lasted for half a week. The final sample comprised 241 social network users, of which 45% were females and 55% were males. The average age of the respondents was 48 years, with the youngest respondent being 15 years old and the oldest being 80 years old. In terms of education, 32% of the respondents held a middle school degree, 29% held a university degree, 19% held a high school degree, and 20% were categorised under 'others'. The three social networks most used by the respondents were WhatsApp (87%), Facebook (65%), and Instagram (39%). A majority of the respondents (61%) reported that social networks were an integral part of their daily lives.

3.2. Survey design

The questionnaire was subdivided into four parts. First, respondents were directed to a welcome page with general information about the questionnaire, including affirmation that participation in the study was voluntary, anonymous, and confidential. Second, on the subsequent

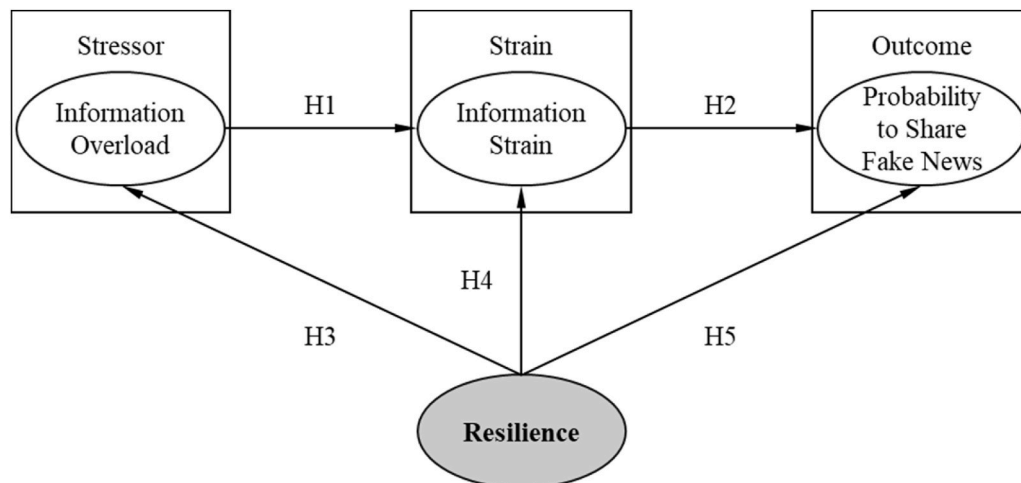


Fig. 1. Conceptual framework.

page, respondents were asked to provide some information on their social network use, such as which social networks they typically use and with what frequency. Third, the respondents were instructed to answer questions based on their experiences during the COVID-19 pandemic. In this part, the respective constructs of interest for this study were asked, as outlined below. The fourth and final part asked for demographic information.

To operationalise the constructs of the proposed model, established multi-item measures using seven-point Likert scales (1 = strongly disagree to 7 = strongly agree) were used from prior academic literature. The scale items were slightly modified to fit the context. The participants answered questions on the stressor-strain-outcome model, including perceived information overload, information strain, probability of sharing fake news, and their level of resilience.

Information overload (five items) and information strain (four items) were each assessed by adapting scales from Luqman et al. (2017). The probability to share fake news was measured with two items taken from Talwar et al. (2019) and consumers' resilience was assessed using three (reverse coded) items from the scale developed by Smith et al. (2008). The scales for the German sample were either translated and re-translated or used from already validated references (e.g., German resilience scale from Chmitorz et al., 2018). Additionally, control variables known to influence fake news sharing behaviour (e.g., online trust) were surveyed. All the items used to measure the research constructs are presented in Table 1. Table 2 reports the mean scores and the standard deviations of the constructs.

Moreover, to address common method bias, both procedural and statistical remedies were employed in the empirical study (Korsgaard and Roberson, 1995). Therefore, next to using established measurements, the participants were instructed to rate the items honestly and were reassured about the anonymity of their answers. Moreover, the questionnaire contained a marker variable following the selection criteria of Simmering et al. (2015). To be precise, the theoretically unrelated multi-item marker variable attitude towards the colour blue was included in the third part of the questionnaire for subsequent statistical analyses. The variable was measured using the same format as the items of the key constructs.

3.3. Data analysis

The hypotheses were tested using structural equation modelling (SEM). By applying covariance-based SEM (CB-SEM), the data analysis followed many recent and adjacent studies on the dark side of social media (Dhir et al., 2018, 2019, 2021; Talwar et al., 2019), as the study's objective was to test the proposed hypotheses rather than engage in theory building. Moreover, SEM can depict concrete interrelationships among endogenous and exogenous variables, thus determining the exact effect strengths while controlling for measurement errors (Steenkamp

Table 1
Measurement items.

Construct	AC	Items	CA	FL
Information Overload	IO	There is more information on COVID-19 than I can digest.	.91	.90
		The information on COVID-19 overwhelms me.		.89
		It is difficult for me to focus on the essential information on COVID-19.		.90
Information Strain	ST	The amount of information on COVID-19 makes me overlook important information.	.80	.86
		I am forced to change habits to adapt to new developments regarding COVID-19.		.72
		I have to sacrifice my personal time to keep up with new COVID-19 updates.		.76
Probability to Share Fake News	FN	I feel that my personal life is being invaded by COVID-19 communication.	.94	.86
		The information on COVID-19 reduces my life satisfaction.		.82
Resilience	RE	I often share fake news on COVID-19 because I don't have time to check its authenticity.	.78	.97
		I share fake news on COVID-19 because I don't have time to check facts through trusted sources.		.97
		I have a hard time making it through stressful events. (r)		.75
		It is hard for me to snap back when something bad happens. (r)		.87
		I tend to take a long time to get over set-backs in my life. (r)		.88

Note: AC = Acronym of construct; CA = Cronbach's Alpha (Construct reliability), FL = Standardized factors loading. 7-pt. response scales (1 = strongly disagree, 7 = strongly agree). (r) = reverse coded item.

Table 2
Measurement model validation and correlation matrix.

Construct	Mean	SD	CR	AVE	Correlations/Square roots of AVE (bold)			
					IO	ST	FN	RE
IO	3.54	1.76	.94	.79	.89			
ST	3.58	1.57	.87	.63	.50	.79		
FN	2.11	1.63	.97	.94	.25	.26	.97	
RE	4.65	1.44	.87	.70	-.25	-.28	-.21	.84

Note: SD = Standard deviation, CR = Composite reliability, AVE = Average variance extracted.

and Baumgartner, 2000). The different research hypotheses were examined based on both magnitudes and significance levels of the structural paths. In addition, squared multiple correlation (R2) values were evaluated to determine the percentage of variance explained in information strain and probability of fake news sharing.

Data analysis was carried out using IBM SPSS 26.0 and AMOS 26.0. It was confirmed that the measurement items were normally distributed. Then, CB-SEM through the two-step process recommended by Anderson and Gerbing (1988) was applied with confirmatory factor analysis (CFA) for the measurement model performed first, followed by the assessment of the ability of the structural model to answer the hypotheses.

4. Results

4.1. Measurement model

Prior to testing the structural model, requirements of instrument validity and reliability must be met. Thus, CFA was performed to test the reliability, convergent validity, and discriminant validity of the scales. The analyses reveal that all constructs' Cronbach's Alpha values exceed the recommended level of 0.7 (Nunnally, 1978) and all composite reliabilities (CR) the level of 0.6 (Bagozzi and Yi, 1988), signifying sufficient reliability. The average variances extracted (AVE) for each construct meet the cutoff of 0.5 (Fornell and Larcker, 1981) and all standardized factor loadings are above the threshold of 0.7 (Hair et al., 1998), confirming convergent validity. Furthermore, the square roots of the constructs' AVE exceed the interconstruct correlations, indicating discriminant validity (Fornell and Larcker, 1981). Also, the correlations between all constructs are clearly below 0.9 (Hair et al., 1998), suggesting that multicollinearity is not a concern. Table 1 presents the Cronbach's alpha values of the constructs and the factor loading values for the individual items. Details for AVE as well as square roots of AVE, CR, and correlation values are presented in Table 2. Overall, the confirmatory factor model fits the data well ($\chi^2 = 0.106.537$, $df = 59$, $\chi^2/df = 1.806$; comparative fit index [CFI] = 0.972; Tucker-Lewis index

[TLI] = 0.963; root mean square error of approximation [RMSEA] = 0.058).

To analyse the potential common method bias, the marker variable technique was employed (Lindell and Whitney, 2001). It examined the highest correlation among the constructs (i.e., $r = 0.14$ between the marker variable and information strain) to correct the correlation matrix for common method bias. The results reveal that all of the significant correlations remained significant after the correlation matrix was adjusted. Therefore, common method bias does not appear to be a concern in this study.

4.2. Structural model

The hypothesized relationships of the conceptual model were subsequently tested via SEM with maximum likelihood estimation, allowing for the simultaneous evaluation of all proposed effects. The goodness-of-fit statistics of the structural model provided a well-fitting model ($\chi^2 = 134.675$, $df = 84$, $\chi^2/df = 1.603$; CFI = 0.971; TLI = 0.964; RMSEA = 0.050).

The findings show that information overload ($\beta = 0.545$, $p < .001$) is strongly positively related to information strain ($\beta = 0.553$, $p < .001$), supporting hypothesis 1. Furthermore, the findings indicate a positive effect of information strain on the probability of fake news sharing ($\beta = 0.264$, $p < .001$), supporting hypothesis 2. To assess whether information strain mediates the relationship between information overload and fake news sharing, a bootstrapping analysis using 5000 samples (Hayes, 2013) was conducted. The results confirm that information strain mediates the relationship between information overload and fake news sharing ($a \times b = .146$, confidence interval_{95%} [0.058, 0.255], $p = .001$).

Regarding the proposed direct mitigating effects of resilience, the analysis shows that resilience has a direct negative effect on information overload ($\beta = -0.302$, $p < .001$), information strain ($\beta = -0.176$, $p = .012$), and the probability to share fake news ($\beta = -0.179$, $p = .013$), respectively. Therefore, hypotheses, 3, 4, and 5 are supported. An overview of the results of the structural model is provided in Table 3. The model explains 39.6% of the variance of information strain and 20.6% of the variance of probability to share fake news.

5. Discussion

While the sharing of information without verification is always considered to be detrimental (Talwar et al., 2020a), the urgency of this issue is exacerbated during crises by the negative effects of fake news on consumers' behavioural responses. Driven by the ubiquitous social media landscape, misinformation related to the COVID-19 pandemic has been found to have deleterious effects on public health and action

Table 3
Results of structural equation modelling.

Path	Standardized Coefficient β	p-value	Result
Hypotheses			
H1. Information Overload → Information Strain	.553	<.001	supported
H2. Information Strain → Probability to Share Fake News	.264	<.001	supported
H3. Resilience → Information Overload	-.302	<.001	supported
H4. Resilience → Information Strain	-.176	= .012	supported
H5. Resilience → Probability to Share Fake News	-.179	= .013	supported
Control variables			
Gender → Probability to Share Fake News	.197	= .001	–
Online Trust → Probability to Share Fake News	.181	= .003	–

(Brennen et al., 2020). Hence, the dissemination of unverified information and the unprecedented quantity of data (i.e., infodemic) are the most significant challenges next to fighting the virus (Islam et al., 2020; Laato et al., 2020b).

Previous literature has started to examine the negative outcomes of the abundance of information on consumers. Among other problems, this information has been found to foster cyberchondria (Laato et al., 2020a, 2020b) and anxiety (Liu et al., 2021). There has also been evidence that information overload is salient to directly predicting consumers' unverified information sharing (Laato et al., 2020b). However, the processual understanding of this empirical linkage between information overload and fake news sharing is still limited. Moreover, prevention mechanisms against fake news sharing that centre consumers have been underexplored. Particularly, the psychological construct of resilience has not yet been considered in that regard, despite proof in related fields that it serves as a shield against social media-induced stress. This is addressed by the current study applying the stressor-strain-outcome model combined with the construct of resilience. To be precise, this study empirically investigated the association between information overload, fake news sharing probability, and consumers' resilience using the ongoing COVID-19 crisis as a thematic anchor.

The first set of research hypotheses (H1 and H2) examined if and how information overload triggers fake news sharing. The empirical results show that information overload is a significant predictor of fake news sharing because it fosters a consumer's information strain (H1), which in turn increases the probability of fake news sharing (H2). The results expand on the findings of previous research (Laato et al., 2020b) by embedding them in the theoretical angle of transactional stress and highlighting the mediating effect of psychological strain. The results are also in line with the tenets of the process of technostress (Ragu-Nathan et al., 2008) by applying the stressor-strain-outcome model in the context of sharing fake news and confirming that the technology-induced stressor (i.e., information overload) leads to a negative behavioural outcome through strain.

The second set of research hypotheses (H3, H4, and H5) investigated whether consumers' resilience can mitigate the stress process leading to fake news sharing by inhibiting the different components of the stressor-strain-outcome model. The empirical results show that resilience is a direct inhibitor of information overload (H3), information strain (H4), and the probability of sharing fake news (H5). Therefore, the results provide evidence for the protective function of resilience in the consumer realm. While prior empirical evidence on the effects of resilience in the field of consumer behaviour is rare, the finding is consistent with prior literature from other fields (e.g., information systems and management), which suggests that highly resilient individuals are less likely to experience or suffer from everyday stressors (Bermes and Gromek, 2021) and are more likely to positively adapt (Kossek and Perrigino, 2016).

6. Study implications

6.1. Theoretical implications

The findings contribute to the literature in several important ways. First, the research contributes to the burgeoning literature on fake news sharing by demonstrating that consumers have a higher probability of sharing fake news when emotionally stressed. Prior research, though still at a nascent stage, has documented different reasons for fake news sharing, such as online trust (Khan and Idris, 2019; Talwar et al., 2019) or expected social benefits (Kozinets et al., 2020). The findings show that exposure to stress can suffice to influence fake news sharing probability. Thus, the study offers novel empirical insights into the recent research by Laato et al. (2020b), which suggested a positive link between information overload and fake news sharing, by clarifying that information overload leads to fake news sharing through the mediating

effect of the consumers' strain.

Second, the study provides a new theoretical lens on fake news sharing behaviour by systematically investigating it based on the stressor-strain-outcome model. While previous research has used the stressor-strain-outcome model in other contexts, such as to explain the link between compulsive social media use and depression or between privacy concern and academic performance (Dhir et al., 2018, 2019), the research shows that the model can also be used to explain why consumers share fake news. Ultimately, the stressor-strain-outcome model could become a robust framework that can explain undesirable consumer behaviours in contexts similar to fake news sharing, such as negative word of mouth (Talwar et al., 2020b), susceptibility to negative information (Hsu and Chen, 2018), or spreading of organisational rumours and fake reviews (Luca and Zervas, 2016), thus offering approaches for mitigation.

Third, the study responds to calls from scholars for empirical research exploring mitigating mechanisms for fake news sharing, particularly for research focused on the consumer. Prior literature has focused on issues such as technical detection and prevention methods (Bode and Vraga, 2018; Chan et al., 2017) and has not yet examined intervening mechanisms for fake news sharing among consumers. Therefore, the present study significantly contributes to prevention literature by identifying consumers' resilience as a shield against fake news sharing. It demonstrates that strengthening consumers' resilience mitigates the transactional stress process leading to fake news sharing by also directly decreasing perceived information overload and information strain. Therein, the study also directly responds to Laato et al.'s (2020b) call to action for the identification of warding mechanisms against informational overload during the COVID-19 pandemic.

Fourth, the study integrates a new construct into consumer studies by debating the link between consumer behaviour and resilience, which has been an underexplored area, and integrating a new construct is viewed as a major contribution in consumer research (Simonson, 2015; Whetten, 1989). Moreover, by demonstrating – based on thorough application of psychological resilience theory – that consumers' resilience can inhibit stressor, strain, and, ultimately, the negative outcome, it provides evidence that resilience not only acts as a buffer in rising consumption-related stress processes but also fosters consumers' ability to positively adapt. This finding is particularly valuable considering that consumers increasingly experience stress in today's digital age (Kucuk, 2016) and that the COVID-19 pandemic highlights and amplifies the everyday stressors faced by consumers (Naeem, 2021). Particularly, this study's technology-induced stressor (social media-induced information overload) resembles the typical daily hassles that consumers experience in the digital era (Bermes et al., 2020). By revealing that strengthening consumers' resilience in the face of this can positively affect their behavioural choices, it is demonstrated that resilience is important to consider in future marketing strategies. This study's finding also contributes to the extant literature in related areas, such as the dark side of technology, as various negative effects of heavy internet and social media use could potentially be mitigated by resilience. This could mean further investigations into the role of consumers' resilience as a shield against problems such as social media fatigue (Dhir et al., 2018, 2019), sleep disturbances (Dhir et al., 2021), internet addiction (Dhir et al., 2015), or cyber-slacking (Nusrat et al., 2021).

Finally, this study adds to transformative consumer research seeking to benefit consumer welfare (Mick et al., 2012). As the findings show that consumers' resilience can decrease subjective stress perception and act as a mitigating mechanism in consumption-related stress processes, strengthening consumers' resilience might further increase their well-being and quality of life (Fletcher and Sarkar, 2013) and prevent negative effects on mental health.

6.2. Practical implications

The current findings have practical implications for various

stakeholders, such as consumers, retailers, social media companies, policymakers, and web administrators. The associations between information overload, fake news sharing, and consumers' resilience suggest that those who wish to curb the spread of misinformation on social media can take two approaches, specifically changing the information environment leading to fake news sharing or enhancing consumers' resilience.

First, for the communication strategy to be adopted during crises and beyond, policymakers, retail and service companies, and others should refrain from following the expression 'the more, the better' if their goal is to prevent the circulation of misinformation (be it health-related misinformation, organisational rumours, or fake news on disrupted supply chains). Information overload needs to be minimised to free up consumers' cognitive capacity to allow for better conceptualising of information and to reduce fake news sharing probability. Practical ways to do so include the following. Instead of providing excessive information on multiple (social media) channels, centralising information on one single, trusted platform would be preferable. Thus, the use of the right communication channel (preferably one central place) is of the utmost importance (Brennen et al., 2020). It is also important to avoid information overload in design (e.g., keeping the information simple, relevant, and clear) and to design communications that pique consumers' imaginations to encourage more efficient processing of information (Ketron et al., 2016). Finally, information overload may be reduced by using infographics (Siricharoen and Siricharoen, 2018).

Second, in terms of making efficient usage of technology, it might be advisable for web administrators to digitally nudge consumers. Digital nudging entails "the use of user interface design elements to guide people's choices or influence users' inputs in online decision environments" (Weinmann et al., 2016, p. 433). As such, consumers could be nudged to verify the source of social media content or to think twice before sharing information on social media. Such nudges have been found to elicit public approval from consumers around the world (Sunstein et al., 2018). It might also be useful to encourage consumers to reduce their screen time (Okeke et al., 2018), thereby implicitly reducing perceived information overload. Implementing 'fake news games', that is, online browser games teaching consumers how to tackle overloads and detect fake news (Roozenbeek and van der Linden, 2019), could further be useful for companies confronted with the effects of fake news.

Third, this study provides explicit managerial implications for search and media companies when it comes to changing the information environment. While some, like Facebook and Twitter, are already filtering out misleading claims (Brennen et al., 2020), the spread of misinformation could be further reduced if those companies restricted the amount of context-specific information that consumers encounter. Algorithms could move away from consumers' preferences and attitudes regarding a critical certain topic, thus diverging from the continuous promotion of similar content (Cinelli et al., 2020).

Fourth, as consumers' resilience can intervene in the transactional stress process leading to fake news sharing at various stages, the implementation of intervention strategies to enhance consumers' resilience is highly recommended. Rooted in developmental psychology, several training programs have been developed to foster resilience in clinical and non-clinical populations (Macedo et al., 2014). While not all can be implemented feasibly in the consumer context (e.g., one-to-one formats; Vanhove et al., 2016), many of these programs build on the common understanding that resources within individuals and their environment, called protective factors, predict their ability to adapt and bounce back in the face of adversity (Windle, 2011). These programs help provide guidance for marketers on how consumers' resilience can be strengthened, namely, by strengthening the protective factors that lead to resilience.

Social support and self-efficacy are particularly well-documented protective factors (Fletcher and Sarkar, 2013) that can be addressed on a larger scale. In the digital environment, social support can be

received by consumers within their online social network (Sun et al., 2019). Following Sun et al. (2019), marketers can enhance perceived social support by offering priority settings and tools that help consumers store, organise, and retrieve messages to facilitate information processing. Implicitly, other resources, such as self-efficacy, will also be mobilised, which is in line with intervention research stating that protective factors do not exist in isolation but function in cumulative ways (Vanhove et al., 2016). Self-efficacy in relation to information overload, for instance, might best be described as consumers' belief in their capacity to execute the behaviours necessary to gain control over the information environment (Bandura, 1982). Policymakers can also enhance consumers' self-efficacy by providing nationwide print or video portrayals of other consumers that limit their exposure to news from too many unverified sources, acknowledging that consumers learn vicariously by observing others (McKee et al., 2006). This is in line with Talwar et al. (2019), who recommend running campaigns with testimonials to educate consumers.

Fifth, consumers can also work on improving their resilience themselves by engaging in behavioural activation, a type of coping that includes rewarding mundane tasks, such as solving puzzles or learning a language (Polizzi et al., 2020). Resilience research in relation to natural disasters provides evidence that behavioural activation reduces the psychological burden imposed by prolonged distress and frees up cognitive resources to contend with stressors (Bonanno et al., 2010); thus, it also seems highly relevant in the context of fake news sharing during the COVID-19 pandemic.

Finally, while strengthening consumers' resilience is an *ex interim* perspective for combating the sharing of fake news, it is recommended that retailers, service companies, and others introduce consumers' resilience (*ex ante*) as a potential part of well-being in their customer relationship management process (Reinartz et al., 2004). It appears that highly resilient consumers are more resistant to stressful events than less resilient consumers; hence, segmenting consumers based on their resilience and addressing these segments differently might help to prevent undesirable consumer behaviour and subsequent critical events during a customer's lifetime. The findings suggest that applying different marketing strategies depending on the level of consumers' resilience could efficiently balance marketing costs so that highly resilient users may need less attention after a potentially stressful encounter, such as service failure (Bougoure et al., 2016), than less resilient consumers.

7. Limitations and avenues for future research

The present study findings and related implications should be considered in light of some important limitations. First, in terms of methodology, this is a cross-sectional study exclusively based on a German convenience sample. Such single cross-sectional studies are unable to inform on the possible changes in given relationships over time. Thus, future research should include longitudinal designs. Furthermore, scholars are encouraged to investigate different countries during critical events because examining only one specific geography reduces the generalisability of the study's findings (Talwar et al., 2021). Second, this study used self-assessed probability to capture actual behaviour. Follow-up studies should analyse actual fake news sharing behaviour by accessing real data. Third, while this study constitutes initial evidence that information sharing during crises (but also beyond; e.g., Furner and Zinko, 2017) is an optimisation, rather than a maximisation, problem, its optimal degree still needs to be assessed, particularly with respect to different sources of information.

Another fruitful avenue for future research would be an in-depth examination of consumers' awareness of their overload-induced fake news sharing process and their resilience. Accordingly, it is recommended that consumers be surveyed not only quantitatively, but also qualitatively in the future to extend the findings of the present study, such as in semi-structured interviews within an explanatory sequential design (Fischer and Riedl, 2017). The combination of methods would be

useful because SEM only supports hypothesis testing, and semi-structured interviews might explain the findings in terms of resilience's intervening mechanism or the sources contributing to information overload and potential non-linear effects (Delpechitre et al., 2019). Finally, this study focused on resilience's direct mitigating effects within the information-induced stress process. Future research could examine resilience's potential moderating effects (Fletcher and Sarkar, 2013). In addition, subsequent studies could explore the potential context dependence of consumers' resilience (i.e., resilience in the face of other consumer-related adversities) and the concrete routes leading to consumers' resilience (i.e., the protective factors).

8. Conclusion

This research explored the association between information overload and consumers' fake news sharing during COVID-19. By utilising the stressor-strain-outcome model, this study provides unique empirical evidence on the concrete process leading to fake news sharing, something that has been underexplored in previous literature. The results reveal the detrimental effect of perceived information overload on consumers' psychological strain and, ultimately, their probability of sharing fake news. When stressed by a mass of information (i.e., when experiencing information strain), consumers are less able to make sense of that information and are more likely to engage in unverified information sharing. However, this research also revealed that consumers' resilience – that is, their ability to bounce back and positively adapt in the face of adversity, which herein refers to information-related stress – serves as an important mitigating mechanism for perceiving information overload, information strain, and the probability of sharing fake news. Hence, in addition to contributing to the literature by connecting fake news sharing to the transactional stress perspective, this research addresses the gap in the research by focusing on prevention mechanisms against fake news that centre on consumers. This research establishes the construct of resilience as a shield in the consumer realm and paves the way for future investigations to further examine consumers' resilience against other negative aspects of social media and alike. The findings of this research also provide crucial insights and beneficial implications for practitioners to consider in conveying information during and beyond crises and to consider in building consumers' resilience. We should acknowledge that we can learn from our experiences during the COVID-19 crisis, as they will enable us to understand consumer behaviour and determine our course of action in the future.

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