Research Article

Antecedents of the use of social media and its effects on startups' resilience and innovation

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Abstract

Objective of the study: Examine which antecedent factors favored the use of social media and which, substantiated in the organizational resilience, provoked innovation in startups in times of pandemic. **Methodology/approach**: A survey was carried out on startups located in the South and Southeast regions of Brazil, listed on the StartupBase, obtaining 119 questionnaires answered by the managers. Structural equation modeling was used for the analysis of the hypotheses. **Main results**: The environment, measured by external pressure, and the organizational, measured by the dimensions of internal readiness and strategic benefits, figure as antecedents of the use of social media. The use of social media has a direct and positive effect on organizational resilience and, mediated by organizational resilience, has positive effect on innovation. **Theoretical/methodological contributions**: The literature is expanded by analyzing antecedents and consequences of the use of social media, particularly related to the capacity for organizational resilience and the promotion of innovation. **Relevance/originality**: Empirical evidence indicates that social media can help develop resilience in startups and, consequently, promote innovation in times of pandemic. **Social/management contributions**: The focus on social media revealed that it can generate benefits in periods of restrictions, since the use of social media substantiated in organizational resilience enables interaction and value creation.

Keywords: Social media; Organizational resilience; Innovation.

Antecedentes do uso de mídias sociais e seus efeitos na resiliência e inovação de startups

Resumo

Objetivo do estudo: Examinar quais fatores antecedentes favoreceram o uso de mídias sociais e que, substanciados na resiliência organizacional, suscitaram inovações em startups em tempos de pandemia. **Metodologia/abordagem**: Uma survey foi realizada em startups localizadas nas regiões Sul e Sudeste do Brasil, listadas na StartupBase, e obteve retorno de 119 questionários respondidos pelos gestores. Para análise das hipóteses, utilizou-se a modelagem de equações estruturais. **Principais resultados**: O ambiente, mensurado pela pressão externa, e a organização, mensurada pelas dimensões de prontidão interna e benefícios estratégicos, figuram como antecedentes do uso de mídias sociais. O uso das mídias sociais tem efeito direto e positivo na resiliência organizacional e, mediado pela resiliência organizacional, tem efeito positivo na inovação. **Contribuições teóricas/metodológicas**: Amplia-se a literatura ao analisar antecedentes e consequências do uso de mídias sociais, particularmente relacionado à capacidade de resiliência organizacional e promoção da inovação. **Relevância/originalidade**: Evidências empíricas indicam que as mídias sociais podem auxiliar no desenvolvimento da resiliência nas startups e, consequentemente, promover a inovação em tempos de pandemia. **Contribuições sociais/para a gestão**: O enfoque nas mídias sociais revelou que estas podem gerar benefícios em períodos de restrições, já que o uso das mídias sociais substanciadas na resiliência organizacional possibilita a interação e criação de valor.

Palavras-chave: Mídias sociais; Resiliência organizacional; Inovação.

INTRODUCTION

The uncertain environment and constantly changing market present challenges for organizations, requiring enourmous efforts to ensure survival (Rodríguez-Sánchez et al., 2021). This scenario of uncertainty can be intensified in the face of disruptive events, such as that observed in the period of the Covid-19 pandemic, which imposed an unprecedented burden on healthcare systems worldwide, and infection control measures caused an economic crisis by abruptly interrupting a large amount of economic activities (Kuckertz et al., 2020).

In this environment of restrictions and difficulties set in place due to the Covid-19 pandemic, social media became the main means of contact or socialization between people (Donthu & Gustafsson, 2020). At the corporate level, social media can be used to acquire information from the market, competitors, and customers in order to promote the company's ability to adapt to sudden changes (Parveen et al., 2013). Social media can also contribute to organizational resilience, especially when used to cope with unforeseen events and overcome challenging conditions and unexpected changes (Lengnick-Hall et al., 2011), such as minimizing the negative effects caused by the pandemic.

The resilience of an organization is directly related to the level of knowledge and skills of its individuals and to the routines and processes through which the organization orientates itself, makes decisions, and establishes an environment of diversity and flexibility that allows it to overcome the potentially negative consequences of a disruptive event (Lengnick-Hall & Beck, 2005). Therefore, resilience is fundamental in contexts of challenges and difficulties (Näswall et al., 2015), being a critical resource in organizations in the face of a changing environment (Jilani et al., 2019), as well as being able to trigger innovations in response to unexpected, unknown or non-routine problems (Anderson et al., 2014.

From this perspective, social media used to mitigate the effects of a turbulent environment can figure as an innovation, in its different dimensions (radical or incremental) and amplitudes (organizational, marketing, or technological) (Gopalakrishnan & Damanpour 1997), for example, by enabling product promotion, customer interaction and engagement, or new marketing strategies. Social media can be especially important for startups (Drummond et al., 2018) that, with resilience, can overcome challenges and exploit opportunities (Lengnick-Hall et al., 2011), which can promote innovation.

According to Olanrewaju et al. (2020), to date, there is little empirical research on the influence of the external environment on social media management in startups. Although the relevance of social media in a turbulent environment such as the Covid-19 pandemic is recognized, the factors that drive startups to use social media, which are characterized by social orientation, open infrastructure, low barriers to entry, and user-friendly interfaces, still remain unclear (Bhimani et al., 2019; Olanrewaju et al., 2020).

Given the research gap observed in the literature regarding the antecedents and consequences of the use of social media, the present study seeks to answer the following question: What antecedent factors enable the use of social media and which, mediated by organizational resilience, foster innovation? In order to answer this question, a survey was conducted with managers of startups located in the South and Southeast regions of Brazil, and the structural equation modeling technique was used for the data analysis.

This study contributes to the managerial practice by addressing the repercussions of the measures taken by the startups in the face of a disruptive event, specifically during the crisis resulting from the Covid-19 pandemic. According to Kuckertz et al. (2020), it is important to address the measures taken by organizations in the face of a disruptive event in order to prepare for possible future

comparable events. Thus, on one aspect, the study addresses the challenging situation arising from the Covid-19 pandemic and, on the other, how social media has been or can be used in the market of operation of startups.

The study also contributes to the literature by examining organizational resilience (Rodríguez-Sánchez et al., 2021), which is relevant in adapting firms to changes in the environment in order to maximize their resources and capabilities (Lengnick-Hall et al., 2011). Buliga et al. (2016) point out that further study is needed to explore the implications of organizational resilience on the innovation of business models. Understanding what precedes the use of social media and the consequences, supported by organizational resilience and its effects on innovation, opens a field for further research to consider these factors together in the face of adverse and turbulent events.

LITERATURE REVIEW AND HIPOTHESES

Unexpected events and sudden changes often surprise organizations (Linnenluecke, 2017). Although they can be interpreted as opportunities, the restriction of the activities of a large part of society due to the Covid-19 pandemic, for example, marks an acute crisis situation (Kuckertz et al., 2020). The epidemiological outbreak forced companies to shut down their activities in most economic sectors. Companies were subjected to short-term challenges, such as in sectors related to health and safety, supply chain, workforce, cash flow, consumer demands, sales and marketing (Donthu & Gustafsson, 2020). This environment demands proactive work, with an eye on the long-term sustainability of the organization (Majeed, 2011).

At this juncture, social media, consisting of websites, blogs, and Internet-based social networks (Kaplan & Haenlein, 2010), enable their users to create content, share news, communicate, and exchange information, in a fast and multidirectional way (Zhang et al., 2018). These channels have been used by organizations to improve their social media performance, increase network users' interest in their organization, and build online relationships with audiences (Parveen et al., 2015).

Social media can also be used with greater versatility for product promotion (Dodokh & Al-Maaitah, 2019). In addition, they can enhance information accessibility and help organizations gain more information about the market, its new trends, greater feedback on products, information about competitors and their tactics, potential customers and their needs (Parveen et al., 2013).

Access to social media has become popular and companies use it for frequent and direct contact, under a wider reach at a comparatively low cost, aiming to get closer to customers (Bhimani et al., 2019). Social media is increasingly focused on potential stakeholders, after all, entrepreneurs use social media for interaction, communication, and relationship development based on shared business interests. The coming together of like-minded individuals in social media communities or online users with common interests represent new business opportunities, particularly for startups, which can leverage the collective intelligence of online communities for innovation (Bhimani et al., 2019; Hsieh & Wu, 2019).

Technology adoption and its subsequent use have been addressed by researchers through a framework (Chau & Hui, 2001; Zhu et al., 2004; Zhu et al., 2006) identifying three contexts of a firm that influence the innovation process: technological, organizational, and environmental (TOE) (Zhu et al., 2004). This framework makes it possible to assess the importance of factors that impact the decision to use a particular technology, such as social media (Cao et al., 2018).

Communication with the target audience comprises the use of internal and external technologies that the company already has and that are available in the market, foreseeing benefits and risks calculated through this technological information. The organizational context, on its turn, involves factors related to the company, such as its degree of complexity, structure, and resources, and is characterized by internal readiness and strategic objectives. Finally, the environmental context is related to the segment, competitors, and access to resources, and is characterized by external pressure (Zhu et al., 2004).

These three contextual factors influence a firm's intention when adopting a social media and the outcomes of its use. Zhu et al. (2004) point out that, although they may vary in certain contexts, these three factors provide consistent empirical support. Therefore, this framework proves to be appropriate for investigating the adoption of technologies, specifically social media, as in the case of the present study.

Cao et al. (2018) investigated the antecedents of the use of social media in a supply chain and found that technological, organizational, and environmental contexts constitute key antecedents to companies' use of social media, which subsequently impact organizational performance. Based on these aspects, the following hypotheses were formulated:

H1: *The technology factor is positively related to the use of social media, in the expected benefits (H1a) and perceived risk (H1b) dimensions.*

H2: *The environment factor is positively related to the use of social media, in the external pressure dimension.*

H3: *The organization factor is positively related to the use of social media, in the internal readiness (H3a) and strategic benefits (H3b) dimensions.*

Often, the only resources startups have at their disposal are those embodied by the founding manager or team (Zhao et al., 2015) and their personal and business networks, which entrepreneurs use to overcome internal shortcomings (Zubielqui & Jones, 2020). The low cost, ease of use, openness, and connectivity of social media can be especially beneficial for these new ventures, as it allows entrepreneurs to overcome challenges by connecting with experts and potential business partners (Kuhn et al., 2016).

The perspective of organizational resilience includes the development of new resources and the ability to keep up with and even create opportunities (Coutu, 2002; Lengnick-Hall & Beck, 2005). According to Lengnick-Hall et al. (2011), organizational resilience is considered thriving because of its inherent ability to capitalize on unexpected challenges and change. Organizational resilience is tied to dynamic competition and the company's ability to absorb complexity and overcome a challenging situation with more skills and knowledge than it had before the disruptive event (Lengnick-Hall et al., 2011).

Environmental turbulence, such as that caused by the Covid-19 pandemic, requires rapid change. Previous organizational assumptions, values, routines, and practices may no longer be suitable for the changing environment (Akgün & Keskin, 2014), so building organizational resilience has become vital to understanding and responding to the crisis situation (Lengnick-Hall & Beck, 2005; Bhamra et al., 2011; Kantur & Iseri-Say, 2012). Thus, the use of social media for reaching more people and direct communication and publicity can drive the development of new resources and the creation of opportunities, which requires organizational resilience. Thus, the following hypothesis was formulated:

H4: *The use of social media is directly and positively related to organizational resilience.*

One of the significant impacts of social media occurs in relation to marketing, which involves digital advertising and promotion, and addresses issues related to customer service and the exploration of

innovative ideas (Dodokh & Al-Maaitah, 2019). Technological tools, such as social media, have potential utility for consumers, which can enable innovation through purchasing behavior, problem recognition, and consumption (Wang & Hajli, 2017). Organizations that use social media are more likely to change the traditional way of doing business to a more modern and innovative one (Parveen et al., 2016).

The challenges regularly faced by organizations require managers to be able to act in response to changes occurring in the environment. In this environment, social media provides feedback and interactions that can be useful for updating organizational business plans (Olof & Grunden, 2014), which represent a paradigm shift in companies, including startups, with the implementation of social media platforms for a variety of business-related goals (Olanrewaju et al., 2020), such as innovation (Bhimani et al., 2019; Zubielqui et al., 2019).

The business model innovation strategy can ensure the company's survival in times of environmental change and turbulence (Buliga et al., 2016). However, it must be taken into consideration that there are associated risks. Managers need to recognize the need for change and make appropriate decisions to meet the challenges (Buliga et al., 2016).

In addition to maximizing results, it is assumed that using social media for communication, getting feedback, and tracking customer needs can encourage innovation (Dodokh & Al-Maaitah, 2019). Thus, the following hypothesis was formulated:

H5: *The use of social media is directly and positively related to innovation.*

The turbulent period arising from the Covid-19 pandemic, in addition to the humanitarian tragedy, presents reflections on the local and global economies (Kuckertz et al., 2020). Thus, resource management and the ability to adapt organizational strategies are fundamental to survival in this period. In this aspect, the use of social media in the corporate environment stands out for its cost-effectiveness (Kaplan & Haenlein, 2010). Social media can be used by small and medium-sized businesses due to its low cost and minimal technical requirements. Therefore, the use of social media by companies is rapidly becoming a crucial phenomenon in business management (Trainor et al., 2014).

In online user communities, these generate or develop new ideas and provide feedback on the posted ideas (Ogink & Dong, 2019), which, combined with the existing knowledge of the enterprise, can generate or improve existing processes, products, and services (Scuotto et al., 2017). By connecting with a community of users of the product or service, social media facilitates user loyalty and the adoption of the process, product, or service (Casprini et al., 2019). In this sense, resilience also proves beneficial, as it strengthens organizational change process and product development efforts under highly adverse conditions (Akgün & Keskin, 2014).

By using social media, startups can connect, communicate, and collaborate with network actors and other stakeholders who generate, modify, share, and discuss content with other users (Kaplan & Haenlein, 2010; Mention et al., 2019). These resources from corporate use of social media can be especially beneficial for companies during difficult and highly constrained times, such as those of the Covid-19 pandemic. In this sense, organizational resilience also plays a prominent role, as it increases the exploitation of ideas, information, and knowledge (Akgün & Keskin, 2014), which can promote innovation. In this sense, the following hypothesis was formulated:

H6: *The use of social media use, mediated by organizational resilience, is positively related to innovation.*

Figure 1 presents the theoretical model of the research, highlighting the proposed hypotheses.

The theoretical model of the research highlights the antecedents (technology, environment, and organization) of the use of social media and the consequences, in this case, organizational resilience and innovation in startups.

Figure 1

Theoretical model of the research
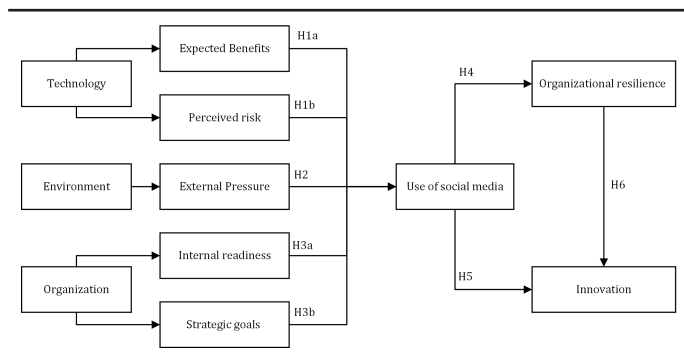
Note: Elaborated by the authors.

RESEARCH PROCEDURES

A survey was conducted in the Brazilian ecosystem of startups listed in the StartupBase, which has more than 13,000 startups. The research sample comprises startups in southern and southeastern regions of Brazil, since they concentrate the largest number of these companies, according to this database, and is characterized as non-probabilistic and by accessibility. The sample is composed of startups from several sectors, among them: technology (app development), sales, insurance, health, agribusiness, among others. This choice was made in order to seek a macro vision of the scenario of startups in different contexts.

The search for individuals working in startups was carried out on the social network LinkedIn, from the list of companies on the StartupBase site. Initially, a LinkedIn connection invitation was sent to owners, partners, directors, executives, managers, and employees, totaling 1,879 invitations. Different positions and sectors were considered in the search, as resilience is made up of different organizational actors (Beuren & Santos, 2019). The 1,161 individuals who accepted the invitation were sent the link to the survey instrument, made available on the Google Docs platform, in the months of July and August 2020. Such months correspond to a latent period of the Covid-19 pandemic, which meets the purpose of the research regarding the use of social media by respondents in the context of the Covid-19 pandemic. A total of 121 responses were obtained, but two were incomplete. Therefore, final sample consisted of 119 respondents, which equates to approximately 10% of accepted invitations.

Research constructs and instruments

The study is composed of three main constructs: antecedents and the use of social media, organizational resilience, and innovation. The constructs were measured using multiple items (Appendix A), with a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

The use of social media corresponds to the various types of social media and the extent of their internal and external use according to the organizational purpose. The social media construct (social media antecedents and the use of social media) was measured through the survey instrument adapted from the study of Cao et al. (2018), which was based on the survey instruments of Bernoff and Schadler (2010) and Spekman and Dotson (2010). The antecedents of social media comprise three factors: technology, environment, and organization.

Technology was analyzed for perceived benefits and risks. Benefits refer to the organization's perception that current technology practices and relationships can generate benefits for organizations (Cao et al., 2018). Risks correspond to the extent of the potential for loss in relation to additional use of social media for organizational purposes (Spekman & Dotson, 2010; Cao et al., 2018). Environment involves external pressure, characterized by the extent of needs signaled by the market regarding the additional use of social media for organizational competitiveness (Bernoff & Schadler, 2010; Cao et al., 2018). Finally, organization involves internal readiness and strategic goals. Internal readiness corresponds to the extent of preparedness in technological, social, and economic terms for the use of social media (Bernoff & Schadler, 2010; Cao et al., 2018). Strategic goals are explicit in terms of sales, customer service, operational results, financial performance, and relationship building (Cao et al., 2018).

The construct organizational resilience addresses traits and characteristics that enable people to engage in creativity (Lengnick-Hall & Beck, 2005), it also covers the ability of people to follow a course of action different from the organizational norm (improvisational agility) (Lengnick-Hall et al., 2011). The construct was analyzed under the improvisational agility dimension using the survey instrument extracted from Beuren and Santos (2019), which was based on the study by Akgün and Keskin (2014). Organizational resilience was addressed in terms of its active aspect, which corresponds to the capacity for resilience (Lengnick-Hall & Beck, 2005; Lengnick-Hall et al., 2011; Beuren & Santos, 2019).

Finally, the innovation construct measures the extent of the company's innovation regarding methods and products and support for innovative ideas (Dodokh & Al-Maaitah, 2019). The survey instrument was adapted from Dodokh & Al-Maaitah (2019).

Data analysis procedures

Data analysis was conducted by initially carring out a descriptive analysis of the data collected in the survey, which essentially involved the theoretical range (scale used), actual range (maximum and minimum), mean, median, and standard deviation. Next, Confirmatory Factor Analysis (CFA) was used to test the reliability and validity of the constructs, respecting the absolute fit measures, Qui² and degrees of freedom, as well as the incremental fit measures: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) Goodness of Fit Index (GFI) and Root Mean Square Error of Approximation (RMSEA). Structural Equation Modeling (SEM) was performed using AMOS® 22.0 statistical software. The application of the SEM is considered appropriate for exploratory research, since the structural model indicates the relationships between variables and presents the amount of variance explained (Hair et al., 2009).

The reliability of the constructs was determined by Cronbach's alpha (CA), with values from 0.6 to 0.7 being accepted. Reliability by CA does not consider errors in the indicators. Thus, we also determined the Composite Reliability (CR), which is characterized as a measure of internal consistency of the items, and the Average Variance Extracted (AVE), which represents a measure of reliability that identifies the overall amount of variance in the indicators explained by the latent construct. Values above 0.7 for CR and 0.5 for AVE are recommended (Hair et al., 2009).

DESCRIPTION AND ANALYSIS OF THE RESULTS

In the analysis, we first present the descriptive statistics of the constructs surveyed, as shown in Table 1, that presents the respondents' average in relation to the questions of each variable.

Table 1

Descriptive analysis of the constructs

Dimensions	Variables	Theoretical Range	Observed Range	Mean	Standard deviation
Technology	Expected benefits	1-5	1-5	4.35	0.81
	Perceived risk	1-5	1-5	4.01	1.02
Environment	External pressure	1-5	1-5	4.27	0.89
	Internal readiness	1-5	1-5	4.13	0.95
	Strategic goals	1-5	1-5	4.37	0.84
Organization	Use of social media	1-5	1-5	4.10	1.07
	Organizational resilience	1-5	1-5	3.73	0.99
	Innovation	1-5	1-5	4.23	0.97

Note: research data.

Table 1 shows that the respondents indicated maximum agreement and disagreement with the statements presented in each construct, since in the theoretical range, which could be from 1 to 5, the observable range obtained values from 1 to 5 in all constructs. These results show divergences in the managers' answers regarding the antecedents of the use of social media. There are also companies that use social media more than others, consequently presenting different levels of resilience and innovation.

It can also be seen that the average of all constructs, except organizational resilience, which had 3.73, is higher than 4. This indicates that most of the companies surveyed agree with the perception of the antecedents of social media, that they made use of media during the Covid-19 pandemic and had a perception of resilience and innovation in this period. Table 2 presents the types of media used by the startups.

Table 2

Types of social media used

Social Media used	Quantity	Percentage
Instagram e LinkedIn	99	83%
Facebook	94	79%
Twitter	37	31%
WhatsApp e YouTube	7	6%
Pinterest	5	4%
Telegram e Blog	2	2%
Skype, Spotify, Tik Tok, Vimeo e GitHub	1	1%

Note: research data.

Instagram and LinkedIn are the social media most used by the surveyed sample, both being used by 83% of the startups, followed by Facebook, used by 79%, and Twitter, 31%. On the other hand, the least used media are Pinterest, used by only 4% of the startups, Telegram and Blog (2%), and other media, such as Skype, Spotify, Tik Tok, Vimeo and Git Hub, used by only 1 company out of the 119 surveyed. This evidence denotes that during the Covid-19 pandemic, among the social media that startups relied on the most to advertise their business were Instagram, LinkedIn, and Facebook.

The confirmatory factor analysis presented the model fit indices evidenced in Table 3. The Chi-Square Quotient (Chi^2)/ Degree of Freedom (DF) represents the differences between the estimated matrices and the observed matrices, whose absolute value must be less than 2, given the sensitivity to sample size (Hair et al., 2009).

As incremental measures, we used the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI), which compare the estimated and null models. The CFI is a normed fit index that compares the estimated and fully independent models, containing model complexity as a measure of fit, so its values range from 0 to 1,

and values near or above 0.90 indicate acceptable fit. The TLI also compares the models, but it is not a normed index. Thus, its values can be below 0 or above 1, the closer to 1 the better.

Table 3

Confirmatory analysis – Model fit indices

Indices	Initial model	Final model adjusted
Qui^2	1529.619	534.581
DF (Degrees of Freedom)	874	316
Qui^2 / DF	1.75	1.692
GFI	0.645	0.755
TLI	0.717	0.822
CFI	0.738	0.840
RMSEA	0.080	0.077

Note: Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA). Research data.

According to Hair et al. (2009), the value of the GFI can vary between 0 and 1, with values close to or above 0.90 representing more acceptable values for establishing model quality. The index Root Mean Square Error of Approximation (RMSEA) is responsible for trying to correct the tendency of the statistics shown in the Chi-square (Qui^2) test to reject models with large samples or large numbers of variables. According to Hair et al. (2009), smaller RMSEA values show a better model fit, and values lower than 0.10 are often observed.

Table 3 shows that the values of the final adjusted model are within the expected range: Qui^2/GL < 2, RMSEA < 0.10 and GFI, TLI and CFI close to 0.9. According to Hair et al. (2009), these indicators should be analyzed together, because none of them alone differentiates good models from bad ones. Thus, in exploratory models, in which the constructs used have not been previously tested in conjunction, which is the case of this research, it is understood that the model can be refined in the future and, therefore, does not necessarily need to reach the exact value of 0.9 for the robustness of the model to be considered acceptable.

The analysis of reliability indices, or the absence of random errors in the measurements of the latent constructs, is presented in Table 4.

Table 4

Reliability Indices

Dimensions	Variables	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average
Tecnologia	Expected benefits	0.81	0.82	0.53
	Perceived risk	0.81	0.82	0.60
Environment	External pressure	0.72	0.74	0.49
	Internal readiness	0.74	0.75	0.51
	Strategic goals	0.85	0.86	0.67
Organization	Use of social media	0.85	0.85	0.54
	Organizational resilience	0.82	0.82	0.60
	Innovation	0.77	0.79	0.56

Note: research data.

The Cronbach's Alpha (CA) of the constructs was higher than the minimum accepted value of 0.7. The Composite Reliability (CR) also reached values higher than 0.7. In the Average Variance Extracted (AVE), all the constructs surveyed reached values higher than 0.5. These results indicate reliability of the measurement scales of the constructs, which indicates validation of the tested model.

Table 5

Discriminant validity

	EB	PR	EXP	INR	SG	OR	INN	USM
EB	**0.728**							
PR	0.073	**0.775**						
EXP	0.182	0.087	**0.700**					
INR	0.149	0.296	0.139	**0.714**				
SG	0.307	0.234	0.196	0.348	**0.819**			
OR	0.108	0.213	0.098	0.334	0.410	**0.775**		
INN	0.108	0.185	-0.074	0.230	0.303	0.521	**0.748**	
USM	0.229	0.223	0.545	0.319	0.304	0.192	0.242	**0.735**

Note: EB= Expected Benefits; PR= Perceived Risk; EXP= External Pressure; INR= Internal Readiness; SG= Strategic Goals; OR= Organizational Resilience; INN= Innovation; USM= Use of Social Media. Research data.

Related the discriminant validity, Table 5 presents the investigated model, using the Fornell-Lacker criterion. As can be seing, the model presents discriminant validity, since the square root of the AVE (highlighted in bold) is greater than the correlations between the other latent variables. Thus, the existence of different measures for different constructs is attested, which denotes evidence of discriminant validity. Thus, it is inferred that the constructs of the proposed model are reliable and valid. This allows us to proceed with the structural model examination, whose results can be seen in Figure 2.

Figure 2

Structural model
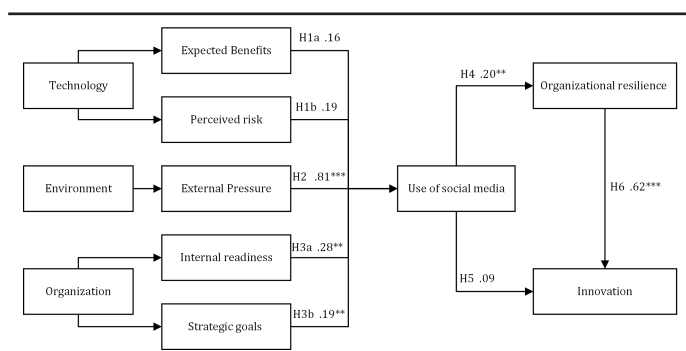
Note: *** = wsignificant at 1% level; ** = significant at 5% level. Research data.

According to Figure 2, which illustrates the antecedent factors that favor the use of social media and, mediated by organizational resilience, influence innovation, the variables that make up the technology factor do not exert a statistically significant influence on the use of social media. Therefore, H1, which postulates that the technology factor is positively related to the use of social media, in the expected benefits (H1a) and perceived risk (H1b) dimensions, is not supported. Although Zhu et al. (2004) pointed out that the benefits and perceived risks of using technology, both technologies that the company already owns and those available in the market, can affect the use of social media by organizations. For the surveyed sample, technology was not one of the factors that led startups to use social media. This result may stem from the fact that the research was conducted during the Covid-19 pandemic, a moment at which companies may have directed their risk-benefit analysis to the crisis, rather than to the technological risks involved.

The environment factor, which comprises the external pressure variable, exerts a positive (0.81) and significant (at the 1% level) influence on the use of social media. Thus, H2, which postulates that the environment factor is positively related to the use of social media, in the external pressure dimension, is supported. This result corroborates with the findings of Cao et al. (2018), that there is a strong relationship between external pressure and the use of social media, indicating that companies may be pressured to make use of social media to connect different partners, especially if their competitors have adopted media to gain business intelligence and competitive advantages. The fact that customers are increasingly engaged in a variety of social media may also leave companies fearful of not keeping up with this flow.

In the organization factor, it is found that the variables that comprise it positively and significantly influence the use of social media, in this case, internal readiness (0.28) and strategic goals (0.19), with a significance of 5%. Thus, H3, which postulates that the organization factor is positively related to the use of social media, in the dimensions internal readiness (H3a) and strategic benefits (H3b), is supported. These results indicate that factors such as less complex organizational structure and companies with clear goals, as usually occurs in startups, tend to make more use of social media, especially in times like the Covid-19 pandemic. These findings concur with those of Cao et al. (2018), that the correct use of internal processes can favor the use of social media, and that lack of capabilities can be a concern in media adoption (McKinsey, 2007). Companies are likely to use social media more if their strategic goals emphasize customer relationships, relationships with partners and suppliers, job engagement and commitment, teamwork, and organizational collaborations (Cao et al., 2018).

After the analysis of the antecedent factors, the research focused on the effects of the use of social media on both organizational resilience and innovation of the companies researched. It is observed that the use of social media influences organizational resilience (0.20) directly and innovation (0.62) indirectly. However, it does not have a direct and statistically significant influence on innovation. Thus, H4, which postulates that the use of social media is directly and positively related to organizational resilience, is supported, but H5, that social media use is directly and positively related to innovation, is not. The results further denote that startups that made use of social media during the Covid-19 pandemic were more resilient, were able to overcome adversity and reinvent themselves. The resilience enhanced by the use of social media contributed to a higher level of innovation by the startups. Thus, H6, that the use of social media, mediated by organizational resilience, is positively related to innovation, is supported.

In general, the structural model analysis can answer the research problem, inferring that antecedent factors, such as external pressure from the environment, organizational structure, and clear strategic goals, favor the use of social media, and that, mediated by organizational resilience, influence innovation. These findings further corroborate what Kuhn et al. (2016) pointed out, that the low cost, ease of use, openness, and connectivity of social media can be especially beneficial for new ventures, such as startups, as it allows them to overcome the challenges they might face when seeking to connect with experts and potential business partners (Kuhn et al., 2016).

In summary, the results showed that the use of social media favored startups to become more resilient, which provided a greater ability to cope with challenging situations, overcoming adversity with different knowledge and skills than they had before the disruptive event (Lengnick-Hall et al., 2011), as well as developing the ability to create opportunities, increase idea exploration (Akgün & Keskin, 2014), and enhance their level of innovation.

FINAL CONSIDERATIONS

The study examined the antecedent factors that favored the use of social media and that, mediated by organizational resilience, influence innovation in startups. The results revealed the presence of two antecedent factors of social media adoption; the environment, in the dimension of external pressure; and the organization, in

the dimensions of internal readiness and strategic benefits. This evidence is in line with the literature, that the factors environment and organization are determinants for the use of social media.

With regard to the use of social media, it was found that its interactive nature favors communication and drives resource development and opportunity creation, and is directly and positively related to organizational resilience. Furthermore, the use of social media, mediated by organizational resilience, may be especially beneficial for companies in the face of disruptive events, such as the Covid-19 pandemic, in order to promote discussion and spark innovation.

This study presents theoretical implications by investigating the antecedents of the use of social media and the consequences of such use, particularly related to organizational resilience and the promotion of innovation, extending this literature. The practical implications lie in the focus of the study, as social media is constantly expanding on both individual and organizational levels, which demonstrates the importance of these tools and the potential advantages of their use. The results of the research revealed that social media can generate benefits for organizations in periods of constraints, and that these tools, mediated by organizational resilience, enable interaction and value creation.

The results of this research indicated that the crisis caused by the Covid-19 pandemic required companies to take measures to cope with it, from security standards to strategies to stay in the market. In this sense, this study contributes by showing that technological tools, such as social media, can be characterized as allies in periods of turbulence, in order to promote organizational resilience and innovation. Managers should encourage the use of social media as a strategy to develop capabilities and keep the company competitive in the market.

Although procedural measures were adopted to mitigate common method bias, the study has limitations. It is important to highlight that the constructs were measured by the perception of the respondents and that the survey instrument addresses issues recently developed in the literature. Therefore, despite the validity presented in the survey, it requires reapplication. Furthermore, the research was conducted with a specific group of companies, the startups, thus the results are restricted to the sample investigated, i.e., it does not allow the generalization of the results to different contexts.

Finally, it should be noted that the purpose of the present study was not to compare the use of social media before and after a disruptive event, but rather to report on the use of these tools during a period of restrictions, as occurred during the Covid-19 pandemic period. It is emphasized that the possibility of using social media in earlier periods is not ruled out, however, this aspect was not investigated in this research. Therefore, such a relationship can be investigated in future research. Furthermore, future studies may investigate other antecedents of the use of social media, as well as other resilience capabilities, or other periods of environmental turbulence that may influence the innovative potential of startups.

Conflit of interest statement

The authors declare that there is no conflict of interest.

Authors' statement of individual contributions

Roles	Contributions		
	Giordani MS	Schlup D	Beuren IM
Conceptualization	■	■	■
Methodology	■	■	
Software	■	■	
Validation	■	■	■
Formal analysis	■	■	■
Investigation	■	■	
Resources	■	■	■
Data Curation	■	■	
Writing - Original Draf	■	■	■
Writing - Review & Editing			■
Visualization	■	■	■
Supervision			■
Project administration	■	■	■
Funding acquisition	N.A.		

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APPENDIX A
RESEARCH INSTRUMENT

You are asked to recall the most challenging situations you have experienced at work as a result of the Covid-19 pandemic and to keep these situations in mind as you answer the questions that follow.

Expected Technology Benefits (Cao et al., 2018)
Please indicate in each of the following assertions your degree of agreement on the expected benefits of technology in your startup.
1. Improves customer relationship management.
2. Increases work involvement and commitment.
3. Facilitates transparent and timely internal and external communications.
4. Improves/strengthens relationships with partners/suppliers.
5. Improves teamwork and organizational collaborations.

Perceived Technology Risks (Cao et al., 2018)
Please indicate in each of the following statements your level of agreement regarding the perceived risks of technology in your startup.
1. Communicate in the right voice.
2. Maintaining a consistent brand representation.
3. Make employees and customers feel comfortable communicating.
4. Gain/maintain customer interest.
5. Trust employees to interact on social media channels and represent the brand.

External Environmental Pressure (Cao et al., 2018)
Please indicate in each of the following statements your degree of agreement about the external environmental pressure on your startup.
1. Our customers are migrating to use social media.
2. Our competitors have been using social media.
3. We will fall behind our competitors if we don't use social media.
4. It is necessary to use social media to establish competitive advantage.
5. Our partners/suppliers use social media.
6. Our employees have been using social media.

Internal Organization Readiness (Cao et al., 2018)
Please indicate in each of the following statements your degree of agreement about the internal readiness of your startup.
1. Company awareness and public relations.
2. Publicity and/or new product launch.
3. Direct sales and sales promotions.
4. Customer service
5. Events, sponsorships and exhibitions.

Strategic Goals of the Organization (Cao et al., 2018)
Indicate in each of the following statements your degree of agreement with the strategic goals of your startup.
1. Improve customer relationship management.
2. Increase work involvement and commitment.
3. Improve/strengthen the relationship with partners/suppliers
4. Improve teamwork and organizational collaborations

The Use of Social Media: Market (Cao et al., 2018)
Please indicate in each of the following statements your level of agreement regarding the use of social media in your startup's market.
1. Use social media to provide customer service.
2. Use social media for company awareness/ reputation and public relations

3. Use social media to manage customer relationships.
4. Monitor/ influence social media sites about our company.
5. Use social media for market research.
6. Use social media advertising and/or new product launches.
7. Use social media for direct sales and sales promotions.

The Use of Social Media: Operations (Cao et al., 2018)
Please indicate in each of the following statements your level of agreement regarding the use of social media in your startup's operations.
We include social media in our strategic roadmap.
2. We have made social media part of our communication strategy.
3. We use information from social media for research on new products or new initiatives.

Please check below the types of social media your company uses:
( ) Facebook
( ) Instagram
( ) Twitter
( ) LinkedIn
( ) Others. Which ones?

Organizational Resilience: Improvisational Agility (Beuren & Santos, 2019)
Please indicate in each of the following statements your degree of agreement regarding improvisational agility in your startup.
1- We have the ability, in the face of turbulence, to follow a course of action considerably different from what is considered the norm.
2. People engage in unconventional strategic repertoires (those that depart from norms) rather than simple strategic repertoires (those that tend to be concerned with a single type of action) to take counterintuitive (foreign to intuition at first glance) actions.
3. We have a complex and varied roster of actions that enables us to follow a course of action that is different from the norm in our company.
4. We have a diverse range of competitive actions available to us to readily adopt unexpected responses to market changes.

Innovation (Dodokh & Al-Maaitah, 2019)
Please indicate in each of the following statements your degree of agreement about the innovation characteristics of your startup.
1. The company is characterized by innovation in production methods.
2. The company has applied innovative methods in advertising its products and services.
3. The company is always looking for innovative ways to deliver its products.
4. The company decided to change the properties of the product's shape and its quality based on an innovative idea.
5. The company encourages innovative ideas.