DARK AND BRIGHT SIDE OF SOCIAL MEDIA IN CURRENT NORMAL

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Editorial: Dark and Bright Side of Social Media in Current Normal

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Editorial on the Research Topic

Dark and Bright Side of Social Media in Current Normal

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INTRODUCTION

The growth of social media worldwide has enabled individuals and organizations to facilitate their interaction, communication, social networking, and relationships (Ali et al., 2019; Pitafi et al., 2020; Khan, 2021b). Social media has enabled individuals to create and maintain social relationships and organizations, and deliver services to internal and external customers using innovative, efficient, fast, and cost-effective business models (Khan and Khan, 2019; Kakar and Khan, 2020). The growth and usefulness of social media have encouraged fortune 500 organizations to use social media to facilitate their communications with employees and reach global customers. However, this relatively rapid growth has also caused even faster growth in negative effects, mainly due to excessive use, cyberbullying, information overload, and wrong or inaccurate information being shared by social media users (Xiongfei et al., 2020; Khan et al., 2022). These negative effects represent an important threat to social media use and the need to effectively understand both the bright and dark sides of social media is urgent (Ali et al., 2019; Bano et al., 2019; Raza et al., 2020). As the relevant technical bodies and organizations are failing to catch up with the fast-growing and changing social media technologies, there is a need to further elaborate on the dark and bright sides of social media (Khan et al., 2019; Khan, 2021a).

SUMMARY

This Research Topic focuses on the impact of social media on individuals, teams, and organizations in the COVID-19 setting. The call for papers was open from November 11, 2020, to November 10, 2021, during the COVID-19 pandemic. Scholars were invited to submit research papers in the field of organizational psychology to two sections of Frontiers in Psychology 1- Organizational Psychology, and 2- Personality and Social Psychology. In response to this appeal, 19 research articles were submitted, with 13 being accepted and published under this theme. The Research Topic presents studies from diverse cultural and industrial settings such as manufacturing and services. It also presents new research approaches and methodologies contributing to the theory and practice in this important emerging research domain.

Keren et al. investigated and compared "Natives and Sojourners" health-protective behavior during the pandemic. They adopted a unified view to proposing a theoretical model by adapting the Health Belief Model and Institutional Theory. Their study noted that media self-efficacy, scientific self-efficacy, perceived health risks, and the perceived benefits of being protected have positive and significant effects on the definition of health-protective behavioral intentions among natives and sojourners in mainland China. Media self-efficacy, and scientific self-efficacy can play a strategic role in formulating public health-protective behavior. They recommend effective communication with sojourners during a crisis and for them to be a part of the national crisis management plan (i.e., infectious disease).

Zheng C. et al. suggested that the COVID-19 pandemic has encouraged organizations to adopt social media and digital technologies to facilitate their employees to perform routine job assignments. They further noted that COVID-19 has created challenges and uncertainties that create a problematic leader and follower relationship. Their study investigated the mediating role of psychological empowerment between the indirect relationship of unethical leadership and extra-role behavior. They further propose the moderating role of perceived organizational support in the relationship between unethical leadership and psychological empowerment and the relationship between unethical leadership and extra-role behavior. Their study focused on how the leader-follower relationship is affected in the IT industry during the COVID-19 pandemic. They show that perceived organizational support is important in mitigating the negative effects of unethical leadership behavior on the extra-role behavior of followers.

Another study by Gao et al. suggested that the useful potential of social media motivated organizations to structure their work design in a way that enables employees to benefit from social media adoption. Their study examined how social media (enterprise and public) adoption by organizations affects their designers' performance by facilitating novelty-focused product design, and efficiency-focused product design. Their empirical findings show that social media (whether for enterprises or the public) is a valuable technological tool that inspires and facilitates designers to create products that are novel and efficient. Their findings show that leaders are more satisfied with designers who produce efficiency-focused products than those who produce novelty-focused products.

In another study, Li et al. focused on how information and communication technology influence the performance of organizations during the current COVID-19 pandemic. Their study is based on complementarity theory, investigating the mediating role of employees' organizational commitment, growth mindset, and entrepreneurial orientation in the link between information and communication technology adoption and organizational performance. The empirical findings of their study show a positive mediating effect on employees' organizational commitment and growth mindset. In addition, the empirical findings do not support the mediating role of entrepreneurial orientation in linking information and communication technology with organizational performance. Their study contributes to our knowledge of the mechanisms that link information and communication technology with organizational performance during the COVID-19 pandemic.

The devastating COVID-19 pandemic has shifted the activities of employees, businesses, and students from physical to virtual work environments. The pandemic has lead to increased reliance on the internet, as people need to use social media for their work, news updates, and to post their own updates (Lindinger-Sternart et al., 2020; Zheng F. et al.), a completely different experience of social media. Several studies on the impact of social media on work productivity, performance, turnover intention, and job satisfaction have been presented since the outbreak of COVID-19 (Zivnuska et al., 2019; Cao et al., 2020; Obrenovic et al., 2020). Furthermore, various studies have examined the impact of excessive social media use on people's mental health during COVID-19 (Yu et al., 2018; Khan et al., 2021).

CONCLUSION

This Research Topic brings together articles that confirm the complexity surrounding social media adoption by individuals and organizations. These articles confirm that social media has important implications for people, customers, organizations and their employees, the general public, governments, and technology and social media providers. Social media has enabled users to connect, communicate, exchange, reach customers, conduct online courses, and work from home during the COVID-19 pandemic (Ali et al., 2020; Khan, 2021; Xiongfei et al., 2021). Moreover, this increased use also brings unintended ongoing threats to the wellbeing of individuals and societies. Studies have recommended the adoption of strategic social media planning in organizations so that they can receive perceived benefits while avoiding certain dark consequences. For individuals, studies have recommended that behavioral modeling and user training are important sources for effectively using social media. However, it is important to note that research on social media is still nascent and researchers must develop comprehensive models to offer better practices for individual and organizational users.

This Research Topic enables management, social media, and psychology researchers to explore the impact of social media on the mental health, productivity, and performance of workers, professionals, business people, and students all over the world (Obrenovic et al., 2020; Zheng et al., 2020; Zhao and Zhou, 2021). During COVID-19, various scholars have observed positive aspects of social media use, particularly in developing more sophisticated and user-friendly applications for working from home and improved services in e-banking, e-learning, and e-commerce (Zheng et al., 2020; Khan, 2021; Ali et al., 2022). On the other hand, some scholars have pointed out that excessive use of social media has caused information overload (Liu et al., 2021), technostress (Nimrod, 2022), and fake news bombardment during COVID-19 (Pennycook et al., 2020), negatively impacting people's mental health (Zhao and Zhou, 2021). Similarly, findings on this theme have presented scholars with suggestions for investigating the impact of social media on people's behavior and performance that could influence future research. For example, further studies could compare the effectiveness of social media before and after COVID-19. Similarly, future studies might look into the influence of social media on the success of COVID-19 vaccine campaigns.

AUTHOR CONTRIBUTIONS

The Editorial was drafted by AK and AA and further edited by NK and TI. All authors contributed to the article and approved the submitted version.

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The Bright Side of Social Media: Social Media Platforms Adoption and Start-Up Sustainability

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This study aims to explicate the contribution of social media platforms adoption on start-up sustainability. Since most economies of the world start-up failure rate are relatively high, there is always a desire or a need to investigate the success recipe. As a result, the primary objective of this study is to understand the social media environment and how start-ups can best utilize social media platforms throughout their life cycle. Based on the qualitative case study approach, five in-depth interviews of social media marketers and individuals working in start-ups were conducted. The finding demonstrates that social media is a crucial virtual platform for striving resource start-ups. Therefore, if a platform gets utilized correctly, it can play an essential role in the sustainable progression of a start-up. Thus, there is a need for start-ups to articulate a comprehensive social media policy for each life cycle stage.

Keywords: start-up sustainability, social media adoption, social media networks, start-up ecosystem, social media platform

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INTRODUCTION

The world has entered the twenty-first century in possession of disruptive technologies, such as the Internet, cell phones, artificial intelligence, robotics, and renewable energy, to name a few. These technologies have paved the way for the creation of disruptive innovation that brings a different set of value propositions in the market (Yovanof and Hazapis, 2008). The study has further added that disruptive innovations redefine the marketplace by creating a value network, thereby disrupting existing market players, products, and alliances. Thus, these technologies are accelerating the pace of product innovation manifold and have significantly reduced the product life cycle (Mujahid et al., 2019). Hence, there is a remarkable effect on the rate of innovation and business development. Therefore, countries such as Finland, Germany, and Sweden, which have supported science, research, innovation, and sustainable development as a national priority, are now among the most prosperous nations (Petru et al., 2019). These nations have environmental sustainability, infrastructure, equity, and an equal chance for each member of the society to succeed. Thus, it has created a need for dynamic organizations that can rapidly carry out research and development (R&D) and continuously bring new products and services to the market. As a result, start-ups get created worldwide in the millions, because they are considered the source of rapid product development. Start-ups have significant contributions to job creation and growth at national, international, and industrial levels (Chodokufa, 2009; Andzelic et al., 2011); thus, they have significantly contributed to economic development (Martínez-Fierro et al., 2020). Start-ups have led to numerous innovative breakthroughs resulting in entirely new businesses (Hathaway, 2016). Therefore, start-ups are believed to be a dynamic enterprise created upon a creative idea for the socio-economic development of a nation. Proper criteria to define a start-up scope are new, active, and independent (Petru et al., 2019). However, many have emphasized innovativeness (Gimenez-Fernandez and Beukel, 2017). Thus, the ultimate goal of a start-up is new product placement, developing information technology, and innovating a process in a global environment while aiming at a long-term gain (Stolze et al., 2014; Frederiksen and Brem, 2017; Mercandetti et al., 2017). To achieve this, technology-enabled start-ups, such as Airbnb, Uber, and other start-ups have innovatively utilized existing technologies to have a significant advantage over their competitors by improving the efficiency of existing products or services. On the other hand, there are high-tech start-ups such as Google, Tesla, and few others who have created technological innovation in their respective fields.

According to Blank and Dorf (2012), vision alone is not enough for start-up sustainability; and there are nine prominent elements: having a target audience, value proposition, customer relationship for demand creation, channels of distribution, vital resources, including suppliers and commodities. Besides crucial partners with other ecosystem members, cost structure, revenue streams, and tasks a start-up essentially performs to attain sustainability contribute to start-up development. In this context, social media is playing a crucial role in the sustainable growth of the start-up (Cestyakara and Surendro, 2013; Gloor et al., 2020). Start-ups are resource-scarce enterprises (Moogk, 2012). Thus, right from the start of their journey, social media is an effective and efficient tool to directly reach out to various players in a start-up ecosystem (Cestyakara and Surendro, 2013; Gloor et al., 2020). Moreover, it enables enterprises to engage customers in mutually beneficial and delightful user experiences (Khan et al., 2020). However, scholars believe that if a customer becomes a victim of cyberbullying, it might create a negative online experience for that individual (Cao et al., 2019).

Moreover, social media tools provide a new way of communication and information sharing among the various players in a start-up ecosystem (Mohout and Fiegenbaum, 2015; Park et al., 2017). Evolving technologies are gaining recognition because they play a key role in creating networking business enterprise networks (Liu and Liu, 2009; Bell and Loane, 2010). Evidence has shown that business enterprises taking advantage of social media technologies have outperformed competitors, and have enhanced efficiencies and reduced cost (Harris and Rea, 2009). Thus, it is vital to understand the impact of social media on the performance of a firm (Wetzstein et al., 2011).

Start-ups, at the onset of their journey, have to demonstrate that they are superior to their peers by the technology they have opted for and the market potential of their offering (Marcus et al., 2013). At its inception, start-ups, because of the absence of production and operational history, have to face many challenges (Zheng et al., 2010; Villanueva et al., 2012). That is why past trends reveal that more than 60% of start-ups fail during the early stage of the life cycle (Lai and Lin, 2015; Melegati et al., 2019). This high failure rate in resource-constrained start-ups is due to various factors that include significant competition (Passaro et al., 2020). The intensity and shape of the challenges of start-ups vary with changes in the life cycle (Gómez, 2007). These challenges arise because of lack of managerial and business knowledge, technological lag, human resources and team management issues, and finally, lack of financial resources that start-ups face over their life cycle (Barazandeh et al., 2015). Hence, start-ups have to strive for their existence and struggle for survival during their life cycle (Salamzadeh and Kawamorita Kesim, 2015). Thus, having a brilliant idea is not good enough for the progression of these start-ups. Instead, there is a consensus among researchers that they must build collaborative relationships with the other players in an ecosystem to enhance their probability of survival and sustainability (Shwetzer et al., 2019; Tripathi et al., 2019). These interconnected players in the start-up ecosystem community formally or informally support start-up creation and sustainability (Mason and Brown, 2014; Isenberg and Onyemah, 2016).

Social media has made it easy for start-ups and other businesses to communicate with their customers, suppliers, and facilitating firms. Thus, these technologies impact how start-ups operate, and how they interact within the start-up ecosystem (Park et al., 2017). Although there is extensive use of social media in business firms, little is known about the impact of technology and social media tools on sustainable performance (Denyer et al., 2011). This acts as an impetus for this study to investigate what role social media can play in uplifting the sustainable performance of start-ups at various stages. Fischer and Reuber (2014) stressed the need to study social media: how an entrepreneur should use it so that researchers on new entrepreneurial ventures can more vigorously study the impact of researchers. The study also explores appropriate social media strategies that start-ups could adopt to engage customers and other stakeholders in the start-up ecosystem during various lifecycle stages, mainly to improve brand awareness and engage the audience. Thus, media adoption would help start-ups to achieve sustainability by employing social equity and economic viability. The study adopts a case study approach and contributes to the literature in the following ways. First, the study provides an in-depth understating of the role of social media in various stages of start-ups. Second, this study highlights social media strategies that could be instrumental in increasing the survivability chances for failing start-ups. In short, the study highlights the bright side of social media in uplifting sustainable performance by providing a platform to create networking with ecosystem players and access to resources that were earlier not available to them. Moreover, it would enhance the efficiency of start-ups and the effectiveness that lead to their sustainability.

LITERATURE REVIEW

Start-Ups: Evolution and Life Cycle Stages

Scholars have long since adopted the biological notion of the life cycle of an organization researcher (Quinn and Cameron, 1983). They have suggested that the evolution of an organization is through different life cycle stages during its journey from start-up to growth (Mintzberg, 1984; Dodge et al., 1994; Hanks et al., 1994). Startup progression is vibrant, nonlinear, and volatile. Bygrave (1989) has used chaos theory as a symbol for organizational progression under and group cultivation. The study further added that this theory can be employed for studying startups and new product development process. Occurrence of an event results in the startup. Development of startup is dynamic, co-evaluate with management (McKelvey, 2002), startup do not achieve equilibrium point just like we have in biological species.

Generally, start-ups have been associated with technological projects, since most of their solution is backed by software produced and reproduced effortlessly (Klačmer Calopa et al., 2014). Hathaway (2016) has characterized start-ups as a yet-to-be-formed business, built upon an innovative business model, financed by start-up capital. Start-ups usually aim to create an innovative product backed by the latest technology. It can achieve a high growth rate by exploring scalable markets (Paternoster et al., 2014). Zajko (2017) has defined start-ups as an enterprise in the early phase of its life cycle. Literature shows that different scholars studying the lifecycle of a start-up have varying phases of start-up progression. The stages suggested by the researchers have varied from a minimum of three to a maximum of five. However, life cycle model fusion concludes that the generic life cycle of an organization passes through five stages: start-up, expansion, consolidation, diversification, and decline (Hanks, 1990). While the study further adds that scholars differ on the number of stages through which an organization passes over the life cycle, there are commonalities.

Similarly, there is an apparent disagreement on the activities accompanied at each stage. There are similarities and differences in the phases of start-up progression mentioned in the literature. According to Crowne (2002), the first stage is about product development and sale. Further added by the study is that once sales start maturing, the start-up firm reaches the stability stage and now focuses on getting an IPO. Picken (2017) has suggested that working with technology development as an initial stage is followed by a transition period that converts the start-up from an informal organization structure into a structured one. It helps them in the scale-up period, which is the make-or-break stage; and according to the author, a start-up unable to scale will lose its journey and will cease to exist. Whereas, Blank (2013) has suggested two models, a product development commences with vision converting into business planning while ascertaining the related issues, and a customer development model begins the journey by identifying customer problems and coming with its solution.

However, for this study, we have adopted the start-up life cycle model that has been suggested by Maurya (2012). According to the study, the lifecycle of start-ups passes through three stages of development.

Problem/solution Fit Stage

A start-up life cycle instigates a problem/solution fit by looking into whether a market has identified any problem requiring a solution. Thus, start-up just needs to solve the market problem. However, the given solution must align with the problem, and the customer is ready to give it a try. In such a scenario, idea generation is not that important.

Product/market Fit Stage

During the product/market fit stage, the start-up team looks into whether the market requires the executed idea. Therefore, after verifying the problem in the earlier stage, it is now time to conduct analyses to determine the utility of the new product in light of its issues.

Scale Phase

The third phase of a start-up is the scale phase. After successfully testing the market for the suggested solution, it is time to look for growth; it means market expansion, adding new employees. Now start-up will be looking at potential growth.

Start-Up Sustainability

Start-up is a composition of scalable and replicable business models working in a risky and uncertain environment. Since start-ups are created upon an innovative idea, they grow at a rapid pace. Thus, it requires more than just capital to be a radical innovator. This entails a predisposition to risk toward experimentation, even failure (Shahzad et al., 2020).

Moreover, start-ups use initial years to develop products without sales, so they depend on funding. There are cases in which 50% of funded start-ups have almost zero output (Nanda and Rhodes-Kropf, 2013). Therefore, if they can survive early years and achieve what has been required by founding members, it is an achievement on their part (Silva et al., 2016). There are many ways to measure start-up sustainability depending on entrepreneurship goals, and it can be financial or non-financial founder team performance or pre-defined expectations.

Moreover, empirical studies suggest that start-up endurance, planning, and product excellence are not enough to attain sustainability (Dahlqvist et al., 2000). Instead, it is advocated that looking for the right customers and caring for them is far more critical. Thus, marketing activities have a considerable impact on the sustainability of start-ups. Start-ups with limited financial resources use social media platforms for promotion, customer education, and creation of brand awareness (Hutter et al., 2013; Seo and Park, 2018). It is recommended that start-ups right from the nascent stage focus on creating brand awareness, conveying the competitive advantage of the offering. Since these things are absent in the early years, it is relatively challenging for them to create relationships with their customers, suppliers, creditors, and other organizations for a mutually beneficial exchange. Consequently, it is tough to develop market channels and acquire financial and non-financial resources. Given that customer satisfaction plays a vital role in business sustainability, to achieve this goal, a start-up should ensure the attention of customers through communication campaigns and brand support (Petru et al., 2019). However, it takes time for an enterprise to create goodwill and brand equity (Korunka et al., 2010; Lohrke et al., 2010).

Social Media and Start-Ups

The inception of the World Wide Web (www), an invention of social media platforms like Twitter, WhatsApp, and LinkedIn, has revolutionized the way individuals communicate and keep in touch with each other, and has drastically changed since then. Simultaneously, individuals can also communicate with their friends and family members to discuss start-up ideas. Social media has become an essential part of our lives (Bano et al., 2019; Khan et al., 2019). Social media is characterized as a cluster of online portals that facilitate its users' in getting audience feedback, share information, encourage participant contribution, allow voting rights, one-to-one communication, and form communities with a common interest (Mayfield, 2008). Kaplan and Haenlein (2010) have described social media as a bunch of Internet-based applications built on the technological and ideological foundations of web 2.0 that allow two-way conversation between start-ups and customers (Fournier and Avery, 2011).

Moreover, previous studies on social media have highlighted the multitude of changes social media has bought to society and its far-reaching effects on how we do business and entrepreneurial ventures work (Fischer and Reuber, 2011, 2014). These technologies have brought about new information and communication tools that have taken the business world and entrepreneurial firms by storm. However, the most talked-about and impactful platform is Facebook, because of the sheer number of users and many features to facilitate communication within social media platforms (Di Capua, 2012).

The increasing power of the Internet and Internet-based social media has challenged the market dynamics and competitiveness of all types and sizes of businesses, stretching from the seasoned corporate sector to newly created start-ups. The rise of social media applications has transformed the start-up ecosystem as well. There is increasing popularity of social media tools in business firms, whether they are start-ups or large corporations (Andriole, 2010; Bell and Loane, 2010). The launching of social media has sent shockwaves in the world of marketing, news media, and even politics (Gruber et al., 2015). This change has provoked marketing firms and businesses to reevaluate their relationship with their stakeholders and reconsider their communication methods (Kietzmann et al., 2011). Thus, social media has transformed into an inevitability for businesses nowadays (AlSharji et al., 2018).

Since the early stage of the life cycle, a start-up has to manage anxiety due to uncertainty in the environment. Moreover, start-ups at the nascent stage have to undertake several sequential activities, such as conducting market research, developing a prototype, hiring new employees, and seeking funds while creating a new venture (Gartner, 1985). To accomplish this, Fischer and Reuber (2011) have suggested that start-ups should use good communication tactics on social media platforms to secure and build an early clientele. In this respect, Facebook is an influential media, since it has many features that facilitate the entrepreneurial ecosystem, such as Facebook groups, calling, and messaging on Facebook messenger. The two more popular social media platforms are Twitter and Facebook (Van Dijck, 2013), becoming an essential resource for young entrepreneurs to connect themselves with the ecosystem. Due to the ineffective nature of communication in the pre-social media era, accessing information, and sharing ideas were challenging for young entrepreneurs (Park et al., 2017). Thus, social media might be used to create business partnerships and collaborations.

Moreover, a social media platform is used for information sharing, thereby creating trust and an enabling environment (Raza et al., 2020). Twitter can be used as a catalyst in this role to enhance business-to-ecosystem and business-to-business interaction for start-ups. Fischer and Reuber (2011) have observed that the word "entrepreneur" is the most common word found in the Twitter biography section of the profile of an individual. Pitafi et al. (2020) have suggested that Twitter activity by team members can help enhance sales. Besides, they have a better chance of getting funding. Fischer and Reuber (2011) have further claimed that Twitter is the most fundamental social media platform used by young entrepreneurs. Users on Twitter can follow their favorite organization depending on their personal views, pursue their interests, and tweet with a limit of 140 words. The word limit makes Twitter a fast mode of putting information as people can post many tweets on any given day. A firm can use this service to polish and publish its brand and gain potential customers (Kietzmann et al., 2011). Furthermore, company recruiters can also use Twitter to find the right people to assimilate into the company (Fischer and Reuber, 2011).

Moreover, start-ups also use a social media platform to interact with other members of the start-up ecosystem for mutual benefit (Raza et al., 2020). Start-ups are increasingly using social media to discuss issues, share information, and collaborate with players in a start-up ecosystem. Social media networking facilitates start-ups in accessing tangible resources such as capital and labor and intangible resources, such as social support, information, and reputation (Bates, 1997; Westhead et al., 2004). Besides, through social networking, start-ups can develop new creative business ideas to enhance their performance (Witt et al., 2008). This networking is also beneficial to start-ups by alleviating ambiguity and edifying the decision process (Autio et al., 2013). Networking facilitates start-ups in reaching out to a venture capitalist (VC) firm. Investors are interested in financing a start-up proposal suggested through their networks. Intangible resources, such as knowledge and experience, are crucial factors that contribute to the success of a start-up (Roure and Maidique, 1986). Here, social media has a role to play by enhancing the effectiveness of knowledge management by substantially enhancing coordination and important knowledge map among team members (Ali et al., 2019). Pitafi et al. (2018) observed that social media adoption facilitates an employee in innovational work and knowledge-sharing relationships. However, personality influences the self-efficacy and online collaboration of an individual (Zheng et al., 2020). Also, social media addiction affects individual performances because of work-technology differences and self-esteem (Khan et al., 2021).

Besides, to have sustainable growth, start-ups must reach out to a maximum number of people. Social media is an effective tool in the current era compared with traditional tools to reach the masses. However, to get the maximum reach out, start-ups must have to ensure their presence in social media sites where they have a maximum number of prospective customers who are hanging out (Sharma and Bharathi, 2013). That is why social media presence is becoming imperative for corporations and start-up firms (Kaplan and Haenlein, 2010). Social media platforms have restructured business management and strategic thinking; and, subsequently, they have introduced a new form of start-up to start-up and start-up to ecosystem communications (Kietzmann et al., 2011). As a result, social media has been hailed as an asset for nascent novice entrepreneurs suspicious of entering a market (Fischer and Reuber, 2014).

Moreover, this helps mitigate the risk attached to start-up firms (Le et al., 2019). Besides, start-ups find social media enabling start-ups, reaching out to prospective customers during crises (Gruber et al., 2015). Likewise, in the early stage of the life cycle, start-up teams have to work in a resource-constrained situation. Working in a hazardous environment, arduous scheduling tasks, and working with multiple teams create stress on team members (Nawaz Khan et al., 2020). However, evidence has shown that social media presence has improved the crisis management skills of teams (Alexander, 2014), which enhances the sustainability of a start-up. The complex and competitive world of business requires that entrepreneurs ensure their presence on social media to communicate with their stakeholders in general and customers in particular (Gratell and Dahlin, 2018). Networking with the players in a start-up ecosystem is a prerequisite to start-up sustainable growth. Thus, social media is crucial for entrepreneurs of today, as it can yield exceptional results if an entrepreneur understands the ecosystem (Bashar et al., 2012). It is pointed out in the literature that the need for social media to do effective entrepreneurial communication is scarce; however, this subject has not been well-researched. Therefore, the focus of this study is on social media adoption on the sustainable growth of start-ups.

Methodology

Research Strategy

The study is conducted to investigate social media adoption on start-up sustainability. This is a qualitative study, where we have applied an inductive research strategy. The case study methodology was adopted to determine the role of social media in sustainable start-up progression. The case study approach is best suited when the goal of a study is to examine a complex subject in detail. Case studies methodology is practical when the purpose is an in-depth analysis of a situation or problem. As a result, one will be better positioned to understand the issue (Noor, 2008).

Thus, quantitative research aims to test, predict, control, and verify phenomena, while qualitative research is focused on human experiences (Creswell and Poth, 2017). Qualitative research is centered on capturing the complexity of human experience through an inductive process, collecting data where participants experience their problems and through an interpretive approach (Creswell, 2007). Inductive research believes that the themes and dimensions emerge from data (Bryman and Becker, 2012). Qualitative research focuses on a bottom-up approach, i.e., the inductive approach (organizing data and themes) means results emerge from data themselves (Creswell, 2007). A semi-structured interview with open-ended questions is used to collect data. An interview is defined as a verbal or oral discussion where an interviewer endeavors to obtain information and get knowledge from an interviewee (Rowley, 2012). The semi-structured interview allows the researcher to explore the experience of participants and gain insight into the issue under study.

The purposive sampling technique is used in this study to select respondents, and it is an effective and appropriate sampling technique for qualitative studies, particularly in research adopting case study methods (Palys, 2008). In the study, we interviewed five people; the first participant is working in a start-up as a brand and social media manager, the second participant as an entrepreneur, and the last three participants are digital marketers and content writers. A small sample size can be sufficient and accurate information within cultural context if participants have a certain degree of expertise in the domain of inquiry (Romney et al., 1986).

The prime objective is to explore the role of social media factors in start-up sustainability, while the secondary goal is to identify the weaknesses in the current social media policies adopted by start-ups. The findings would facilitate a start-up in better organizing its social media strategies.

The interview of five individuals from social media and start-up community, the detail of which is already mentioned, is used to collect data. In the case study, a research interview is the best technique to gather data. However, due to COVID-19, online interviews are conducted through the mutually agreed online meeting portals. These interviews were audio-recorded with the consent of the participants. Each recorded interview was transcribed for data analysis.

FINDINGS

The study explored the role of social media, an element of a start-up ecosystem, in start-up sustainability. The start-up life cycle model suggested by Maurya (2012) has been adopted to conduct this study. According to the model, start-ups pass through three phases during their life cycle and development, the problem/solution fit stage, the product/ market fit stage, and the scale phase. The respondents of the study are a blend of people from start-up and digital marketing domains. As already mentioned in the methodology chapter, data collection is done through interviews. First, we asked the respondents about the role of social media in start-up sustainability. In the view of respondent #1 usage of social media handles by start-ups creates visibility and talkability with customers and other ecosystem players. It helps them stay in the game as social media keeps them in touch with their customers. They are, thus, improving the chances of start-up sustainability. Since it is a very rocky journey, it is not a smooth ride from a start-up to a mature company. Besides, social media handles are effective tools to announce any changes in your organization or the product offering as per the way you wanted to rather than people grasping inaccurate rumors from the market that might hamper investor confidence besides safeguards against customer retraction. Respondent #2 replied that statistics show that 8 out of 10 people are now using social media. Moreover, it is free as well as people are aware of this tool. Thus, the influence of social media is increasing tremendously; therefore, start-ups can utilize social media to reach out to their current and prospective customers and other players of start-ups. Here, the respondent gives an example, start-ups like Daraz and Foodpanda made their social media influence side-by-side with their apps; this helps gain market recognition, so, in the respondent's opinion, there is no more versatile tool in existence than social media. Respondent #3 considers that the most prominent role of media platforms in creating sustainable start-ups is connecting them with the targeted market. These platforms are a tool to reach customers at the lowest possible cost, and they are bridging the gap between a buyer and a seller where distance is insignificant. In this regard, respondent #4 acknowledged that the role of social media is vital in the dynamic business world. Therefore, one needs to be smart, productive, and well-communicated about business functionality. Besides, you give knowledge to the customer about your product or services should be parallel to your conductivity, which means what you promise must deliver or delight (wow! factor) your client/customer. Respondent #5 believes that social media adoption can boost a start-up by capturing the target audience through attractive, catchy promotional ads for brand awareness. Hence, social media acts as a game-changer for them.

Then, we sought the views of the participants about how social media can facilitate a start-up throughout its life cycle. There is consensus among the participants that social media has a role to play during the start-up life cycle. Respondent #3 believes that social media platforms can facilitate a start-up throughout its life cycle. In the earlier stage, social media platforms help in opportunity identification. In contrast, in the product development stage, promotions are announced *via* social media. Finally, in the maturity phase of a start-up, it provides feedback from both satisfied and dissatisfied customers. Moreover, a social media platform offers an opportunity for a start-up to satisfy a disgruntled customer while it converts satisfied customers into an influencer. Respondent #2 considers that social media has a significant role in brand awareness, thereby attracting potential customers. Moreover, this is the cheapest way to reach the masses and later filter them according to a particular category. Besides being a digital marketer, the respondent firmly believes that an effective social media marketing campaign would prolong the life cycle of a product or service during the maturity and decline stages. Respondent #5 experienced that if start-ups appropriately utilize social media marketing (SMM) tactics, influencers, or paid marketing, they have rightly created awareness of the product/services and a footprint of the product in the brand of customer. Respondent #4 has emphasized social media adoption from the early days of start-up. It would benefit a start-up when taxing on the runway for take-off. Since people recognize you are a start-up, they are ready to avail of a service or product from you; while in the decline stage, social campaigns are a source of product repositioning. Similarly, respondent #1 emphasizes that the launch stage is more about growth hacking; thus, it requires creating awareness. Most start-ups work on a cumbersome burn model that attracts new customers and new business partners through a behavioral change. That is why in the initial stages, start-ups announce unique product offerings and value-added services to mass consumers and potential customers. While start-up grows at a rapid pace and once reaches maturity, it is more about building a brand, and that is where the social media platforms come in very handy. During this phase, they announce campaigns to social causes that they care about or any value-added service they offer to customers, so all this is about brand-building for the maturity stage. In the earlier stage, cash-starving start-ups cannot afford call centers for complaint resolution, so social media is an excellent cheap alternate in such circumstances.

Regarding the third question about how they look at social media as a saver for failing start-ups, this enhances their survivability. Respondent #3 has observed that an influencer plays a vital role in reviving a failing brand. Since social media is also a significant influencer, there is a chance a properly articulated social media campaign can do the miracle for a nearly failed start-up, so in his opinion, failing start-ups should take influencers on board. Here, affiliate marketing is one of many techniques that could help start-ups re-establish themselves. Likewise, influencers could be previously satisfied customers. While respondent #2 has shared a case of the coffee brand Waghera, it has outlets in different parts of the country. According to the owner, after 1.5 years of operations, they did not have enough money to pay the salaries. Suffice it to say, it was a failing establishment, but then they grew and the secret to that growth was social media marketing. They gave people brand awareness and ran campaigns on social media. The story ensures that you are open to suggestions of the people; it helps the owner understand the wants of customers and trends to boost sales. Similarly, suppose start-ups are having a hard time selling their offerings. In that case, it can use social media marketing by making catchy targeted ads, so the consumers become curious and come in to buy the service and judge the hype. Moreover, we also see that on social media, we see one trend which becomes a hit, and then every other brand rushes to take a bite of the pie. For example, the wide-scale adoption of "memes," which are just funny pictures on the Internet, to market a product has also sky-rocketed. However, previously, they were considered informal, and companies stayed far away from them. Here, respondent #5 has shared a case of a service provider start-up that has faced customer iteration during the early days of the COVID-19 pandemic. The start-up has chalked out an excellent social media marketing campaign to reach out to the clientele during the lockdown. In a short time, the start-up was able to generate enough cash flow. The respondent further added that the right strategy would work and change the losing firm into a profit. Respondent #4 has said that social media is a tool to communicate with a broader audience; thus, one can use it in a way one wants, so it may not give you hyper-growth, but it will create a level of dependability and trust with your customer and the community you operate in, which will subsequently help you on rainy days. Respondent #1 added that the start-up industry is very vibrant the world over, moreover, in the MENA region, Pakistan, India, United Arab Emirates, Egypt, and Saudi. That is why start-up releases the most dynamic and aggressive content on social media; at times, such content gives you great reach, visibility. so, most of the time, you will see social media handles of different start-up companies trending number 1 on Twitter in different markets; this is because of the creativity of the content they share. They creatively touch sensitive issues of society and try to spread a positive message, but sometimes these efforts backfire. However, either way, you get many reaches, and visibility and that at the end of the day, from a marketing and business standpoint, helps you grow, so, whether it is negative or positive (which is even better), you get much reach in society, so these companies release such vibrant and aggressive campaigns in the market. You know this is one way to turn tables around at tricky corners, so this is one way in a short period to improve your growth numbers and business numbers. Although it might not be a sustainable approach, it can give you the type of reach you want on social media channels once a season, so this is one way to save failing start-ups by utilizing their social media and releasing vibrant and aggressive campaigns and content with the community of customers to help you regain momentum in your numbers.

Lastly, we are interested in knowing the appropriate social media strategy for start-up sustainable growth. Here respondent #4 has argued that social media moves fast, while start-ups also go through a period of changes. Therefore, start-up social marketing strategies should be lively and should be reviewed and adjusted as needed. Respondent #2 has revealed many social media strategies that various businesses are currently employing. With the sheer power of social media, any type of strategy can yield exceptional results if well used. Start-ups can use unpaid marketing; there are pages and public Facebook groups. On these groups, freelancers and start-ups advertise themselves by posting their products or get guidance from industry-leading experts. This non-paid marketing also includes the use of "memes," as mentioned earlier. In comparison, paid marketing through social media is a revolutionary strategy. It is more efficient and cheaper than TV advertising because you would have to hire a team, and you will have to hire actors, which is costly for a young start-up. Industry giants, such as Samsung and Huawei, have also adopted this strategy. We use social media more than we consume digital media nowadays. That is why it has a more significant impact on the mind of a consumer. As a result, it makes a brand more recognizable and increases sale volume. Respondent #3 has suggested that start-ups should hire a social media company. Since start-up teams may be experts in product development, they do not know how to manage social media platforms and get the most benefit from social media platforms as they are just beginners. The purpose of hiring is to understand the industry, understand the market, understand the customers, and then step two to share your KPI's. You should share your short-term and long-term goals with that social media management company. It will help the start-up create a strategic social media policy that will benefit them in the short and long run. Respondent #5 suggested that social media marketing strategies such as wisely optimizing social media pages, using influencer marketing, and having live sessions are critical social media tools that start-ups can utilize for their sustainable growth. According to respondent #1, the most important thing is to have a strategy. Unfortunately, the way the respondent has seen start-ups work in this part of the world, especially the communication they release on social media, does not seem to be thought through, which should not be the case, and thus it is crucial to have a year-long strategy. The first thing to do is to make a calendar for the different events in your demographic. For instance, starting the year, we get the 14th of February, Valentine's Day, an excellent opportunity to cash in on for the market to make an incredible campaign on valentine. Similarly, there are national, religious, and social events in every country, so you have to plan all year round to keep engaging with your customers, which the respondent believes is the only sustainable way to utilize your social media for growth and the best of your business, but unfortunately, that does not happen. So, first, you need to have a clear view of what your purpose is. Then, it is essential to create a strategy to build a brand over the long term. These aggressive campaigns or these sorts of one-off stunts can get you to reach for a certain amount of time. However, for a longer time, you need to be continually engaging with your customers. At times this community of customers and stakeholders will reach out to you in your inbox, in your comments, with all the problems and the nasty stuff they have to say about your company. However, you know, as a tech start-up and as a business that is trying to disrupt the social-economic system, this is something that you should be prepared for. It is crucial to have a strategy. It is imperative to have a year-long strategy aligned with your purpose and communicate with society on different happenings. That, the respondent believes, is something start-ups should look into and plan accordingly as well. It takes time to build the best brand, but you should have a mature plan to achieve that goal. Thus, it is essential to have a clear strategy for the 365 days of the year to build a brand accordingly.

DISCUSSION

In the dynamic world of business, the role of social media is exponentially increasing and becoming important; start-ups are no exception. Social media tools create significant opportunities for individuals and primarily for entrepreneurs (Fischer and Reuber, 2011). Thus, the development of digital technology in the entrepreneurial sphere is a challenge for both policymakers and entrepreneurs (Thomas et al., 2019). It has necessitated the need to have a clear policy for social media portals. Since it can create visibility for them, please stay in the game with start-ups having in their early years. To achieve this end, start-ups should adopt social media right from their inception. Moreover, being the cheapest mode of reaching prospective customers for cash-starving start-ups, it helps start-ups in creating a wow! factor to their client/customer. Social media enables enterprises to showcase their offerings and what customers value (Sharma and Bharathi, 2013). Social media is a valuable tool to the public the strategic changes being brought about, or policy being implemented, hence deterring against rumors being spread in the market, shattering investor confidence or customer retraction. Social media as an influencer tool helps entrepreneurs persuade their earlier partners (Fischer and Reuber, 2014). Thus, social media plays an important in start-up sustainability.

Social media platforms are the cheapest way to reach the masses. An enterprise can use social media platforms to communicate with its customers and gain trust (Kietzmann et al., 2011). Its role for a start-up changes with the changes in the lifecycle stage. Adopting social media at the nascent stage of a start-up is a tool to create awareness and create a start-up image and recognition in public; it would help them grow. Besides, social media is a vital source to make public the offerings of a start-up, moreover, a medium to listen to dissatisfied customers, resolve their issues/problems, and bring them back, since affording a call center is not possible for cash-starving start-ups. Social media enhances the organizational capability to collaborate, communicate with stakeholders, build customer relationships, and manage knowledge (Smits and Mogos, 2013). Since start-ups multiply, it is time to create a brand here, and social media plays a catalytic role in achieving this goal. While recruiting new customers is quite expensive at the decline stage, converting satisfied customers into influencers will prolong the maturity stage.

Social media is a crucial influencer since it is followed by many. Therefore, failing start-ups, by utilizing their social media and releasing vibrant and aggressive campaigns and content with the community of customers, will regain momentum in your numbers. Besides, catchy advertising to a targeted audience through social media can also be a good option. Moreover, start-ups can utilize this media as an affiliate marketing influencer by hiring satisfied customers. In short social media can provide much-needed reach to failing start-ups, thereby improving their numbers and business (Ghezzi et al., 2016; Basri and Siam, 2017).

Start-ups are always looking for sustainable growth. To achieve this goal, they must make a comprehensive social media strategy to operate in the dynamic environment in the context of technology, markets, and competition to have sustainability (Nambisan, 2017). One suggestion is to hire social media companies to benefit from social media platforms since start-up teams are not aware of this medium. Still, an imperative recommendation is to have a long-term strategy aligned with the goals of the start-up, an aspect that is missing in the start-ups of this region. To have long-term sustainable growth, start-ups should develop a comprehensive social media strategy. Then, they should make a year-long plan to engage their customers; it is the only sustainable way to utilize your social media for long-term sustainable growth.

CONCLUSION

The goal of the study is to explore the role of social media adoption in the sustainable growth of start-ups and current social media practices in the start-up sector. The study followed a qualitative case study approach to achieve this objective. The overarching focus of this study was on themes, namely, social media adoption influencing start-up sustainability during various stages of start-ups, survivability of a failing start-up, and, finally, sustainable growth of a start-up. The findings reveal that social media can be of great benefit to start-ups throughout their life cycle. It can be a source of communication with customers and for complaint resolution. Besides, it is the cheapest source of marketing to the masses and segments of society.

Moreover, if they adopt the appropriate strategies, failing start-ups have a good chance of revival. We conclude that social media can play 2-fold instrumental roles. First, it is one of the essential sources of marketing of a start-up. It can lead toward sale augmentation and contribute to the brand equity of firms. Second, social media can also contribute to the improvement of business processes. It implies that social media might be utilized to execute business processes besides marketing and promotion activities. The study concludes that social media can be a vital source to reduce the failure rate of start-ups. However, the downside is that start-ups of the region lack articulation of a clear and precise social media policy to gain maximum out of this vibrant tool.

IMPLICATIONS AND LIMITATIONS

It is better to take the key players of social media, practitioners, and members of the start-up ecosystem on board to chalk out a comprehensive policy for the sustainable development of a start-up. Start-ups should articulate a long-term strategy as per the nature and requirement of their business for engaging social media. Social content should be created by keeping potential customers and culture in mind. The findings imply that a non-conventional way of using media can accelerate business growth manifold. Embedding social media with a business process can be a sustainable competitive advantage. Thus, an appropriate digital strategy is required to infuse social media in business processes.

This study has viewed social media adoption in general. In future studies on each social media platform, there is a need to separately examine the impact of each social media platform on start-up survivability. Another limitation of this study is that it investigates the start-up sector only, so in the future, a similar study could be conducted for other sectors to explore the role of social media in their progression. Besides, this study explores start-up survivability by social media adoption. However, start-up survivability might be probed by the adoption of other online tools, such as websites.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because it is a qualitative survey. The respondents have requested to not share their identity. Requests to access the datasets should be directed to saeed@jinnah.edu.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Research Ethics Committee of Mohammad Ali Jinnah University, Karachi. Written informed consent to participate in this study was provided by the participants.

VOLUNTARY PARTICIPATION

Moreover, there are tremendous challenges in qualitative research related to privacy concerns of a participant, lack of consent, deception, and participant security concerns, because of research complexities. In this respect, it is worth mentioning that all the participants of the study were recruited voluntarily. Their consent to participate in the study was sought before scheduling an interview. Furthermore, they were properly briefed about the purpose and aim of the research, and the rationale for recruiting them as participants in the study. After that, it is their decision whether they want to participate in the study or not. Moreover, a consent form was sent to them to sign and return to the researcher. Once we received the signed consent form, then we scheduled their interview session.

AUTHOR CONTRIBUTIONS

MMuj conceived the idea and helped in writing the introduction and literature review. He has also interviewed the participants, analyzed the interviews, and wrote the discussion part. MMub wrote the conclusion and implications of the study. He also helped in writing the Literature Review. All authors have read and approved the final manuscript.

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BRIEF RESEARCH REPORT
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A Study on Improving Customer Value Based on the Effect of Word of Mouth

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The overlapping effect originates from an extension of Mendel's law in genetics, where one of the interactions between non-alleles is called additive effect. It is more applied in studies on overlapping brand niches in marketing today, with relatively few researches on continuous customer value creation characterised by user adhesion and need matching. Based on the need matching and user adhesion that are features of the mobile Internet era, this article proposes a model for continuous customer value creation based on overlapping marketing. According to grounded theory, this article extracts three types of factors—demand effect, user effect, and overlapping marketing—that affect continuous customer value creation in the smart terminal business. From the perspective of service perception, this research explores how overlapping marketing affects product requirement matching and user adhesion based on a survey of 491 participants, and validates the theoretical model and hypotheses. It is found that overlapping marketing can effectively enhance need matching, improve user adhesion and increase customer value. This research not only addresses the confusion regarding need matching and user adhesion in the communications market, but also reveals how the smart terminal business affects continuous customer value creation in the era of the mobile Internet through overlapping marketing, combined with need matching and user adhesion.

Keywords: word-of-mouth marketing, sales promotion, need matching, user adhesion, continuous customer value creation

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INTRODUCTION

With the globalisation of the economic system and market competition, the status of customers has also evolved fundamentally. Customers determine the competitiveness of a company in the market as well as its ability to continue operation. In order to have a long-term friendly relationship with customers and develop sustainable profitability, many companies pass on to customers more value that better meets their needs, thereby driving customers to repeat purchases (Rokeach, 1973; Kumar and Reinartz, 2016; Payne et al., 2017). Thus, how to use marketing tools to effectively enhance the enduring customer value when customers use products of a company has become a heated topic for marketing scholars (Wong et al., 2005). Several scholars propose sales promotion and word-of-mouth marketing, which are currently the main marketing methods (Yang and Mattila, 2016).

However, they also have limitations. This article intends to use the overlapping marketing strategy of both sales promotion and word-of-mouth marketing to enhance the transfer value and perceived value of customers, and then study its influencing mechanism on the continuous improvement of customer value. Existing researches on marketing theories mostly concentrate on the enhancing effect of single methods, but rarely on the method of overlapping marketing; little research has been done on the effect of different methods on the marketing of different services at different stages. This study plans to use consumption promotion and customer adhesion as mediating variables to study the mechanism of continuous customer value creation from the joint perspective of customers and enterprises, and propose and verify a model of continuous value creation based on overlapping marketing.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

Literature Review

Current research on customer value is mainly carried out from three different perspectives. The first is to research and define customer value from the perspective of customers, mainly from the value firms create for customers (Yingzi et al., 2004). Holbrook (1996) proposed the overall assessment of the utility of a product or service after weighing the benefits perceived by the customer and the cost of acquiring the product or service and named it customer-perceived value. Kumar et al. (2000) proposed customer transfer value, that is, the difference between total customer value and total customer cost. The second is to study customer value from the perspective of enterprises, typically represented by customer lifetime value (CLV). CLV refers to the total revenue that each buyer may create for the enterprise in the future (Linjie et al., 2005). The process from the beginning of the customer–enterprise relationship to its end is a development trajectory that changes over time, which is called the customer lifecycle. It has been found that the reciprocal relationship between firms and customers, and customers' contribution to the profits and expenses of companies exist throughout the entire customer lifecycle (Krstevski and Mancheski, 2016). The third is to study customer value from the joint perspective of customers and firms. The focus is on the value exchange process between the two, which not only realises the transactions required by customers and firms, but also forms some other economic and non-economic relationships. Few influential research results from this perspective have been achieved.

Existing research focuses on measuring the effectiveness of customer value enhancement. The definition of customer value from the perspective of customers provides sound theoretical support for customer-oriented marketing; the definition from the perspective of enterprises extends the theoretical research to generate the concept of CLV. However, the current CLV research focuses on the measurement of CLV. Jackson (1985) laid the foundation for the research on CLV measurement by first proposing a measurement model based on the traditional net present value method of measuring CLV. Many scholars have extended this research and explored the measurement of CLV (Berger and Nasr, 1998; Mihai and Salerno, 2002). Although domestic and foreign scholars have conducted extensive theoretical research and exploration regarding the measurement of CLV, it is still challenging to measure and estimate CLV in practice, mainly because of the inapplicability of current CLV measurement methods. More and more management practices have made it clear that the cost of trying to win a new customer by any means is far higher than that of maintaining an existing one. The industry is in urgent need of a method that can provide corporate practice guidance to enhance customer value.

Enterprises can make use of the sales promotion marketing method to increase the transfer value of customers. Sales promotion is a direct temptation by providing additional value or incentives to salespersons, distributors, or end users of products, with the primary goal of creating immediate sales. Kotler and Keller (2004) stated in their new version of The Principles of Marketing that sales promotion is defined as a variety of short-term incentives used to encourage purchases, promote a product, or provide a service (Kotler et al., 1996). If advertising and personal selling push customers to buy a product, then sales promotion pushes them to buy it immediately. Enterprises also use the word-of-mouth marketing method to enhance customers' perceived value. Word-of-mouth marketing is the oldest marketing tool. As early as half a century ago, foreign scholars pointed out that word-of-mouth communication was the most important source of information for some households. Word-of-mouth marketing, supported by new technologies, is an increasingly popular research area in the international marketing community (Chae et al., 2016; Buttle and Groeger, 2017). Currently, word of mouth is also one of the most influential communication channels. Consumers generally give higher credibility to word of mouth than marketer-oriented communication (personal selling, advertising, business promotion, public relations, etc.). On the practical level of corporate marketing, word-of-mouth marketing requires that companies use a variety of effective methods to involve corporate customers in discussions about their products, services, and the overall corporate image. Firms need to encourage customers to introduce and recommend their products or services to surrounding people, thus facilitating the creation of consumption behaviour.

With the deepening of research, however, researchers have found that even though "sales promotion" and "word-of-mouth marketing" are currently the main marketing methods in terms of promoting consumption, studies in both fields have limitations (Dost et al., 2019; Yang and Mattila, 2020). The limitations of studies on sales promotion lie in the following: sales promotion only boosts short-term sales without long-term effects; frequent discounts can cause consumers to develop an inaccurate perception that the discounted price should be the reference price, so that when the price returns to normal, consumers develop averse attitudes to it; sales promotion can weaken brand reputation among consumers, destroy brand equity and encourage consumers to measure product quality by price (Brown, 2005); and sales promotion only affects the timing of purchases without affecting the purchase volume, so consumers tend to make more purchases during promotions than during off-promotion periods. The limitations of studies on word-of-mouth marketing lie in the following: theoretical research mainly emphasises the relationship and influence mechanism between word of mouth and marketing; research based on practical application focuses on how to better use word-of-mouth marketing to benefit companies; although some findings have been obtained, there is still a lack of systematic research on the control of marketing effects to explain the correlation between word-of-mouth marketing and value enhancement.

Research Hypotheses

Overlapping Marketing and Need Matching

Resick et al. (2007) compared the interaction effects of personal–organizational value matching, personal–work attitude matching and personal decision-making ability matching on job satisfaction. Work attitude matching proved to have the greatest predictive effect on job satisfaction, while value matching had a certain effect and decision-making ability matching had no significant effect (Huijuan and Lirong, 2009). Kumar et al. (2000) proposed that with the emergence of product homogeneity, enterprises should carry out overall product innovation. There was an interactive relationship between core product innovation and consumers' basic needs, and continuous innovation of formal products and additional products could meet consumers' linear and attraction needs (Krishnan et al., 1999). Balbontin et al. (2000) argued that the link between consumer needs and product innovation required the organic integration of market-driving and market-driven models. It is critical for companies to develop both market-driving and market-driven skills, and to understand when and in what ways they should work together. Dellaert (2018) proposed that new digital technologies mean that firms need to define new marketing actions that create value for consumers who are also co-producers. Based on this, the following hypothesis is proposed:

> **H1a:** Overlapping marketing promotion management has a positive impact on need matching.

Overlapping Marketing and User Adhesion

Yu et al. (2007) constructed a theoretical model to explain how the technical and management design attributes of virtual communities affected the perceived utility, entertainment and sense of belonging of users, thereby promoting user adhesion of virtual communities. Hallowell (1996) analysed that user satisfaction and user loyalty were the main factors affecting user profitability, while personalised services, community infrastructure, activity-based communication opportunities and perception of community circle of friends significantly affected continued user participation, and increased user adhesion with technical and management design factors (Sharda, 2009; Halverson, 2011; Tu and Yuan, 2012). Nalin (2009) proposed the social reading community as a new model of transformed traditional mobile reading. Based on an introduction to user adhesion and other concepts, the author proposed strengthening user adhesion through reviews, interaction, and viral marketing. Bansal et al. (2004) built a user adhesion model of the social reading community through five dimensions—user needs, product/service characteristics, user experience, content provider characteristics, and demographic characteristics—to aggregate user adhesion and develop a profit model supportive of its own operations. Based on this, the following hypothesis is proposed:

> **H1b:** Overlapping marketing promotion management has a positive impact on user adhesion.

Need Matching and User Adhesion

Rowley (1996) believed that compared with traditional brand communication media, mobile terminal shopping presents new features of initiative, integration, and interaction. Starting from product catalogues, practical tools, creative games, and promotional discounts, among others, design user adhesion that meets brand demands and users' inherent needs, focus on user experience, align content creativity with brand demands, and combine user experience with brand image to maintain and enhance the adhesion of brand users (Yeager and McGrath, 1996). Bowonder and Miyake (2000) summarised the influencing factors of industrial cluster networks into a basic platform, including the trust network, knowledge or skills network, logistics network, and environment network. The author analysed the structure of these cluster networks and studied their changes from the perspective of the general law of industrial evolution. More specifically, the process of creating network competitive edges through the connection and interaction between production networks, resource networks, and environment networks was extended to establish a better network structure, which was then associated with the deep user adhesion in the industry. Halverson (2011) posited that users were linked together through TAG, RSS, IM, or EMAIL during need matching. According to the "Six Degrees of Separation" theory, the social circle formed by user-centric connections will increasingly expand to form a strong adhesive network. Huang et al. (2015) proposed that information quality, service quality and alternative system quality had positive effects on user stickiness. Based on this, the following hypothesis is proposed:

> **H2:** Need matching has a positive impact on user adhesion.

Need Matching and Customer Value

Shelp (1984) and Iansiti and West (1997) proposed combining technology and market in the process of emerging technology management to maximise the creation and realisation of value. In this process, many value activities were attributed to the customer value system and the customer value chain structure of emerging technologies. Bond and Houston (2003) argued that the customer value chain could eliminate the uncertainty of emerging technologies, and transform potential technologies into achievable business value, so as to meet customer needs and realise value. Huang et al. (2015) confirmed the causal relationship between the quality of products and repurchase intentions. Based on this, the following hypothesis is proposed:

> **H3a:** Need matching has a positive impact on customer value.

User Adhesion and Customer Value

Parasuraman and Grewal (2000) argued that the context-awareness service was a kind of mobile information service, which mainly used smart terminals and intelligent networks to sense the context of users. Dai (2002) mined user data and predicted user behaviour through intelligent computing, to ultimately provide users with personalised and accurate comprehensive information services. Reichheld et al. (2000) studied the mechanism that drove customer loyalty from a lifecycle perspective, and established three main determinants of customer loyalty: customer value, customer satisfaction, and customer trust. They further revealed the relationship between the three determinants and customer loyalty as well as the customer relationship lifecycle. Morgan and Hunt (1994) revealed the dynamic characteristics of customer relationships by applying the lifecycle theory, and established the relationships between customer loyalty, customer satisfaction, customer trust, transfer costs, customer value, and customer relationship lifecycle according to the dynamic development stage. Thus, the following hypothesis is proposed:

> **H3b:** User adhesion has a positive impact on customer value.

Therefore, the research model and hypotheses are proposed based on the literature review and proposed variables (see **Figure 1**).

RESEARCH METHOD

Measurement

Overlapping Marketing

This study referred to the sales promotion scale by Brown et al. (2005) and developed a theoretical marketing management scale for the traffic data user group, with a total of 8 items divided into word-of-mouth marketing and sales promotion. For the processing of the two types of data on sales promotion and "word-of-mouth marketing," their product divided by 5 was used to obtain the appraisal data on overlapping marketing. The specific formula is as follows[1]:

$$OEA_i = \left(\frac{\mathrm{SPM}_i}{n}\right) \times \mathrm{WMM}_i; \quad i = 1, 2, 3; \quad n = 5;$$

[1]OEA, overlapping effect appraisal; SPM, sales promotion management; WMM, word-of-mouth management.

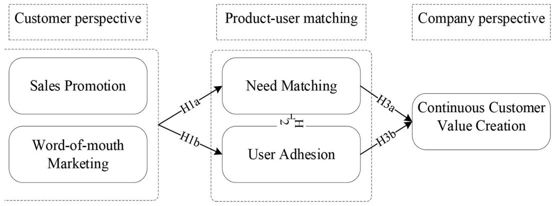

FIGURE 1 | Conceptual model.

Need Matching

Referring to the need matching scale of Hackman and Oldham (1980), a need matching scale for traffic data user groups was developed, with a total of 5 items divided into physiological safety needs matching and social respect needs matching.

User Adhesion

User adhesion mainly focuses on users' attitude and closeness to the use of traffic data, including the degree of user adhesion, such as their fondness degree, loyalty, frequency of use, customer satisfaction, and customer trust. Therefore, five questions were developed referring to the scale of agglomeration degree of Chang and Chuang (2011).

Customer Value

Combining the customer value scale of Parasuraman and Grewal (2000), a customer value scale for data services was developed, with a total of 4 items, including package value, traffic value, ARPU value, and voice value.

A five-point Likert scale was adopted, with 1 for completely disapprove (or totally disagree), and 5 for fully approve (or fully agree), to facilitate a comparative study of the different scales.

Sample

The sample consisted of students using smart terminal services from universities in Sichuan, including undergraduates and postgraduates. According to the 2018 CNNIC data, 21–30-year-olds (mostly college students) account for the highest proportion of mobile Internet users in China. This article adopted the random interception method on campus to distribute surveys. To analyse the collected data, we used SPSS and WarpPLS 3.0 software. The reasons for choosing PLS were as follows: first, it could evaluate the structural model and measurement model, and measure the linear and non-linear relationships in the integrated model; second, it could measure prior variables and intermediate variables; third, it had no high requirements for the sample size and scales (Rosenthal and Rosnow, 1991; Bagozzi and Yi, 1988; Chin et al., 2003).

Data Collection

The data collection was as follows. First, two groups were selected, with five people in each group; face-to-face interviews were conducted, mainly to see whether the items in the questionnaire could be fully understood. The questionnaire was then adjusted and modified based on the feedback to form an improved pre-survey questionnaire. Then the investigators were trained before issuing questionnaires to ensure that participants could fully and correctly understand the items in the questionnaire, and unified training on key elements was carried out. Third, a pre-survey was conducted. A total of 160 completed questionnaires were collected, of which 131 were valid, and a final questionnaire was formed based on the pre-survey results. Ultimately, a total of 561 completed questionnaires were collected for formal survey, of which 491 were valid, with an effective rate of 87.52%. Among the respondents, 57.64% were male and 42.36% were female. Most of the respondents (79.43%) were between 20 and 29 years old. 92.26% of them had 3 years of Internet use.

RESULTS

Overall Index Model Analysis

In this study, the goodness-of-fit test was used to evaluate the fitness of the structural equation model (SEM) (Fornell and Larcker, 1981; Anderson et al., 1988), including the average path coefficient (APC), the average R square (ARS), and the average variance inflation factor (AVIF). The APC and ARS of the model were both significant ($p < 0.001$) and the AVIF was less than 5, indicating that the overall fitness of the model met the requirements (see **Table 1**).

Hypotheses Test

The SEM method was applied in our data analysis. The WarpPLS 3.0 software was adopted to test and verify the hypotheses of this article. In the calculation process of the structural equation, data for the overlapping marketing appraisal were obtained from the average of the word-of-mouth marketing data multiplied by the five-point rule average of the data on the sales promotion degree. Data for the mediating variables of need matching and user adhesion and for the dependent variable of customer value were obtained from the questionnaire survey. The results show that overlapping marketing has a significant impact on need matching ($\beta = 0.59$, $p < 0.001$) and user adhesion ($\beta = 0.56$, $p < 0.001$), thus Hypotheses 1a–b are verified. Need matching has a significant impact on user adhesion ($\beta = 0.33$, $p < 0.001$), verifying Hypothesis 2. Need matching ($\beta = 0.53$, $p < 0.001$) and user adhesion ($\beta = 0.62$, $p < 0.001$) both have a significant impact on customer value, thus verifying Hypotheses 3a–b. Therefore, overlapping marketing generates significant impacts on customer value through need matching effects and user adhesion effects. The R^2 value of the dependent variable represents the predictability of the theoretical model. Falk and Miller (1992) believe that the interpretation of results is valid only when the R^2 value of dependent variables is greater than 10%. The model explained 35% of the variance of need matching, 47% of the variance of user adhesion, and 58% of the variance of customer value. Therefore, the research model had a good interpretability. The detailed results are shown in **Figure 2**.

TABLE 1 | Model fit indices and *P*-values.

Index	Model
APC	APC = 0.275, $p < 0.001$
ARS	ARS = 0.287, $p < 0.001$
AVIF	AVIF = 1.122, good if <5

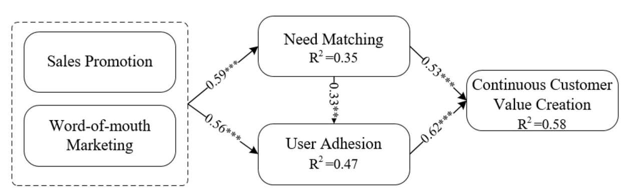

FIGURE 2 | Structural equation analysis results. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. *Represents the significant level.

DISCUSSION AND CONCLUSION

Conclusion

This study created a model for continuous customer value creation based on overlapping marketing, verified scales for need matching, user adhesion and overlapping marketing appraisal, and explored the impact of China's smart terminal business on continuous customer value creation under the effect of overlapping marketing. The results proved that overlapping marketing could enhance enduring customer value creation by improving need matching and user adhesion.

Theoretical and Practical Implications

The contributions of this study are threefold. First, this study has analysed the relationship between overlapping marketing and continuous customer value creation, building a continuous customer value creation model for overlapping marketing. Second, a method for appraising the joint effects of word-of-mouth marketing and sales promotion has been proposed, and an overlapping marketing relationship between need matching and user adhesion has been established, thereby extending theories on overlapping marketing of smart terminals.

This research also provides some practical implications. Data traffic consumers show differentiated product requirement attributes and user adhesion attributes in the information age. The communication consumers of the past mainly used fixed traditional communication services, without even trying services on emerging smart terminals. Today's communication consumers, however, use not only a variety of different communication services, but also different data applications, hoping to satisfy a higher level of Maslow's needs in the mobile Internet era. This pattern of product requirements and user adhesion has generated different positioning of marketing. Enterprises need to dynamically and continuously optimise product resources based on consumer needs and the characteristics of user groups to maximise the value of combining product and service resources. In addition, the ultimate source of competitive advantage lies in the overlapping and different features of word-of-mouth marketing and sales promotion in integrated marketing. Only through effectively combining these overlapping and different features, thereby implementing effective overlapping marketing, and adjusting marketing strategies, can a company maximise need matching, enhance user adhesion and increase customer value.

Limitations and Implications for Future Research

This study has limitations due to the limited knowledge accumulation of the author and certain research conditions. First, this study adopted a dual perspective of need matching and user adhesion, but did not explore the joint effect loading matching relationship from the multiple perspectives of market environment relationships. Based on this article, subsequent research can take into account the market environment relationships to further explore the joint effect loading matching relationship. Second, some environmental factors, such as the COVID-19 pandemic, have changed consumer buying behaviour and the effect of overlapping marketing. Future research should fully take these factors into account. Third, the sample of this study consisted of college students from a single province. The sample data therefore failed to reflect the differences between groups in various regions, so the research results were not sufficiently representative. Subsequent research can include more samples and regions based on this article to further verify and deepen the conclusions of this article.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Beijing University of Post and Telecommunications. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

Both authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. Both authors contributed equally to formulating the conceptual framework, analyzing the data, and writing the manuscript.

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ORIGINAL RESEARCH
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What Explains Natives and Sojourners Preventive Health Behavior in a Pandemic: Role of Media and Scientific Self-Efficacy

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The COVID-19 pandemic triggered a severe global public health emergency. The current research investigated and compared "Natives and Sojourners" health-protective behavior in Mainland China during the pandemic. We adopted a unified view to propose our theoretical model by adapting the Health Belief Model (HBM) and Institutional Theory (IT). The data obtained through an online survey questionnaire from 435 respondents during the second and third quarters of were analyzed. Structural equation modeling (SEM) was used to empirically analyze the proposed model. The media self-efficacy (MSE), scientific self-efficacy (SSE), perceived health risks (PHRs), and the perceived benefits of being protected have positive and significant effects on the definition of health-protective behavioral intentions among natives and sojourners in mainland China. Media and SSE can play a strategic role in formulating public health-protective behavior. The current research recommends an effective communication with sojourners during crisis for them to be a part of the national crisis management plan (i.e., infectious disease).

Keywords: health belief model, media self-efficacy, scientific self-efficacy, China, sojourners, COVID-19

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INTRODUCTION

COVID-19 emerged as a pandemic in the first quarter of the year 2020 and had social (Yezli and Khan, 2020), ecological (Muhammad et al., 2020), political (Kerr et al., 2021), and economic (Qian et al., 2021) effects all over the world. At present, no internationally recognized measures are used as standards to cure COVID-19 patients (Li et al., 2020). However, preventive measures, e.g., wearing masks and gloves (Shahnazi et al., 2020), frequent washing hands (alcohol-based disinfectants or soap; Wang et al., 2021), restricting travel (Pandita et al., 2021), and physical distancing (Yezli and Khan, 2020), are implemented by institutions and governing bodies, because these measures are effective and helpful in controlling COVID-19 transmission. Although these all safety measures as discussed above have significant scientific justification, none of the existing research accounted for the role of scientific reasoning or individuals' scientific self-efficacy (SSE) to map quantitative behavioral map in society.

In terms of health-protective measure during the current pandemic crisis, several constructive initiatives are observed in the developing (Yezli and Khan, 2020; Zandifar and Badrfam, 2020;

Wang et al., 2021) and developed (Gallacher and Hossain, 2020; Heald et al., 2020; Kuchenbuch et al., 2020) countries. In China, strict measures are implemented and have helped normalize the situation. These measures included a nationwide lockdown (Fanelli and Piazza, 2020). All the provincial-level regions in Mainland China launched a top-level response to deal with the COVID-19 crisis in the first month of 2020, which included extending the Spring Festival holiday, postponing all school openings, and implementing strict travel restrictions (Xinhua, 2020). Though, the existing behavioral studies addressing COVID-19 have adapted several theoretical stances to enrich the understanding and process of conceptualizing health-protective behavior of individuals. The role of institutions and society as macro-level forces has not been recorded yet, especially in case of its moderating effect on the health-protective behavioral intentions.

At the time of the spread, 492,185 overseas students from 196 countries (Zhong, 2019) and almost one million expats were in China (People's Daily, 2019). Sojourners are expats who usually face social integration issues in foreign countries. However, few researchers have investigated the psychological impact of the pandemic on sojourners, particularly how these sojourners acquire correct news (information) or what influences their health-protective behavior. As a significant difference exists among sojourners and natives, no trace of comparative analysis of sojourners and natives exists. Thus, a socio-psychological persuasive psychological model is needed to compare the health-protective behavior of sojourners and natives.

The COVID-19 outbreak has led to fear, worry, and anxiety worldwide. Shigemura et al. (2020) highlighted that COVID-19 has negatively impacted well-being, which aggravated the public's fear and anxiety. Ma and Yan (2020) highlighted that the spread of false information of COVID-19 caused various kinds of fear, anxiety, and depression, which aggravated the difficulty of epidemic prevention and control. Zandifar and Badrfam (2020) also confirmed that misinformation about COVID-19 and social isolation have led to the public's mental morbidity. Several studies stated that the Chinese and international media have a significant impact on the psychological response, perception, and knowledge-seeking behavior (Xie et al., 2020). Moreover, Gohel et al. (2021) stated that insufficient knowledge and lack of education are great challenges to surmount in dealing with the current pandemic crisis. The above-discussed trends and significant role of international and national media highlight that the cognitive factors of individuals need immediate need to underline individual's ability to process and identify and access reliable sources of information. In other words, the literature signifies the role of media self-efficacy (MSE) and highlights the dire need to explore it further, especially in the time of crisis.

To address the research gaps as stated previously, this current research initiative aims to determine the role of media and SSE in formulating public health-protective behavior during a crisis. The current study adopted the theoretical perspective of cognitive psychology. The health concern factor (i.e., perceived exposure) was considered as exogenous to define individuals' cognitive process and expectancy value-driven factors. Specifically, in the case of health concerns, the significant constructs defining avoidance (perceived benefits and barriers of being protected) and severity of the risk [perceived health risk (PHR)] were proposed in mapping health-protective behavior. The current research adopted the Rosenstock et al. (1988) stance, in which the fundamental attribute of self-efficacy from social learning theory was incorporated, diffused into Health Belief Model (HBM), and stretched further by introducing new streams of self-efficacies (media and scientific) in the HBM's setting. During the current pandemic crisis, the roles of the normative environment (Cheng et al., 2020) and regulatory force (Al-Sabbagh et al., 2021) have been studied. However, the literature does not state where external (regulatory) and normative support can be recorded in a unified manner while adopting HBM. Therefore, to strengthen the novelty and to address the research gap, the Urban and Kujinga's (2017) institutional view was adopted; in this view, only the regulative and normative environment is considered.

The current research had three significant contributions. First, the current study extended the spectrum of self-efficacies by discussing media and SSE simultaneously to present their strategic roles in perceived health-protective behavior in mainland China. Second, the current research incorporated the Urban and Kujinga's (2017) institutional view and Rosenstock's HBM to underline the role of normative and regulative environment in conceptualizing health-protective behavior. Moreover, the study compared the role of proposed efficacies (media and scientific) and institutional factors (regulatory and normative) in the case of sojourners and natives in mainland China.

THEORETICAL BACKGROUND

In the current century, the world has witnessed several health crises, i.e., Ebola, MERS, SARS, and COVID-19 (Laato et al., 2020); several research initiatives can be seen in the literature while emphasizing consumer behavior and risk mitigation or adopting strategies (La-Torre et al., 2009; Choi et al., 2017; Nie et al., 2020). Within the hood of health psychology, various behavioral theories exist. These theories underline the role of persuasive socio-psychological constructs while conceptualizing health-concerned behavior of individuals, e.g., conceptualizing the health-protective behavior of the workforce (Barello et al., 2020; Mathai, 2020; Almazyad et al., 2021) or being vaccinated to avoid serious health crisis (Hu et al., 2017; Zampetakis and Melas, 2021). In each scenario, most of the health-protective theories underline the constructs that can help mitigate the health challenges or adopt measures to avoid health challenges (i.e., pandemic crisis).

HBM is one of the most valuable frameworks for explaining health-related behavior, as it comprises the attributes of risk perception and behavioral evaluation (Cao et al., 2014). In the pre-COVID-19 literature, HBM has been used to underline the breast self-examination behavior (Didarloo et al., 2017), oral cancer prevention (Jeihooni et al., 2019), exercise-related injury prevention program participation (Gabriel et al., 2019), and healthy housing material selection of boomers

(Kwon and Ahn, 2019). Moreover, during the current pandemic crisis, HBM has been used to determine the consumers' perception of forest therapy tourism (Zhao and An, 2021), individual readiness towards home quarantine (Al-Sabbagh et al., 2021), the role of community pharmacists in offering effective communication to society (Carico et al., 2020), and citizens' readiness to get vaccinated (Zampetakis and Melas, 2021). The intensive use of HBM in recent times signifies its significance and meaningfulness in depicting public health-protective behavior. Therefore, HBM was adopted in the current research initiative, because it helps define the following inter-construct relationships, including (1) the role of perceived sense of exposure in driving individuals' preventive or protective behavior (Jones et al., 2015); (2) the current study further stretched the stance of Nexøe et al. (1999) as exogenous constructs (perceived barriers and benefits of being protected) in the HBM, which helped explain health-protective behavior. A similar pattern was observed in the study of Tong et al. (2020), who examined the attitude towards adopting precautionary measures during the current pandemic (COVID-19). Champion and Skinner (2008) reported that the fundamental constructs of HBM do not have definite relationships. To maximize the explanatory power of the research, several studies extended HBM (Zampetakis and Melas, 2021) or adopted other theoretical stances to incorporate with HBM, i.e., Theory of Planned Behavior (Zhao and An, 2021), Multidimensional Locus of Control Theory (Nexøe et al., 1999), and Social Cognitive Theory (Reid and Aiken, 2011). Jones et al. (2015) also analyzed different sets of arrangement within HBM, i.e., the parallel and serial mediating effects of benefits and barriers of being protected, to define health-protective behavior.

Carpenter (2010) observed that in the early traces of HBM, the essence of self-efficacy was rarely used. However, in recent decades, it became an integral part of HBM, as it holds a significant explanatory power to define public health concerns and protective behavior (Carico et al., 2020; Mirzaei-Alavijeh et al., 2020; Shahnazi et al., 2020; Tajeri et al., 2020). In existing HBM-based studies, self-efficacy was noted as a significant construct in exploring COVID19-related behavioral research (Niu et al., 2021). Zhou et al. (2020) suggested that correct news (information) could be an effective measure to control and reduce disease spread during the pandemic crisis, as self-efficacy enables individuals to seek valid and reliable health-related information in a more systematic fashion (Shang and Zuo, 2020). In particular, during COVID-19, the conspiracy theory endorsement was recorded as a great challenge, especially when considering international media sources in China; it signified the role of cognition (Su et al., 2021). In line with the arguments by Su et al. (2021) and Rosenstock et al. (1988), the current research bifurcated cognition to propose the media and SSEs, thereby helping explain how these efficacies can benefit information processing (Xiao et al., 2021) and allow individuals to think critically (Austin et al., 2016) while formulating perception of risk and health-protective behavior. Several researchers explained the role of media (Cheng et al., 2020) and scientific (Stosic et al., 2021) as a part of cognition (belief and efficacy) in the recent literature addressing COVID19-related behavioral studies.

To enrich the theoretical and practical novelty of the current research, the Institutional Theory (IT) was adopted to quantify the impact of endogenous factors as moderators. This theory has been used to study organizations and individuals within organizations (Kurtulmuş, 2019). Institutions can be understood as "rules of the game in a society" (North, 1990) that help shape individuals' beliefs and their nonrational behaviors (Scott, 2001). The IT comprises three principal pillars, namely (1) regulative (2) normative, and (3) cognitive support (Scott, 2001). Urban and Kujinga (2017) stated that the regulative pillar refers to authorities' regulations or guidelines to reward or punish actions (Valdez and Richardson, 2013). Normative pillar means the social norms of society that individuals attempt to comply with (Seelos et al., 2011). Cognitive pillar comprises the templates and scripts shared among a community or nation (Seelos et al., 2011). Wu et al. (2019) indicated that an individual's intention and behavior are significantly affected by the normative environment. In particular, collectivist cultural countries have a high level of norms for individual behavior (Furnham et al., 2012; Shi et al., 2017). Thus, in the context of the current research setting, the proposed model took the regulative and normative concerns into account. These concerns can be diffused with HBM as cues to action, because HBM-related literature argues that cues can range from internal or external sources; cues to define health-protective behavior are still an underdeveloped attribute of HBM (Jones et al., 2015). Therefore, the current study takes this stance as an opportunity to use regulatory and normative support as a set of cues to act towards health-protective behavior. Bavel et al. (2020) argued that regulatory and social factors are essential to drive constructive social change and individual behavior during COVID-19.

Apart from the argumentation about the theoretical stance for the current research, the fundamental characteristics of sojourners and natives need to be studied and distinguished. Ang et al. (2017) indicated that migrant workers who have more financial barriers to obtain healthcare services are more likely to suffer from low psychological well-being. Dias et al. (2013) state that migrants experience numerous socio-cultural, legal, economic, and communicational constraints, which expose them to many health risks. For instance, immigrants from non-native language-speaking countries encounter linguistic barriers to healthcare and access to service. Furthermore, recent literature emphasized the impact of the source of information (news) in China when defining readers' conceptualization of risk and fear of COVID-19 (Su et al., 2021); this source helps in the formulation of health orientation (Liu, 2021), drives negative emotion, and affects psychological resilience (Giri and Maurya, 2021). However, no previous report stated the use of the HBM in any setting to compare the sojourners and natives and to conceptualize the differences that can potentially drive practical implications and future research direction. Thus, in the context of the above-discussed argumentation, the following constructs' relationships are proposed for sojourners and natives in Mainland China during the pandemic crisis to map their health-protective behavior.

HYPOTHESES DEVELOPMENT

Several recent studies emphasized the significance of HBM in examining the public's behavior during the pandemic crisis (Almazyad et al., 2021; Al-Sabbagh et al., 2021; Hong et al., 2021; Wu et al., 2021). In the current research, the four constructs from the HBM, namely (1) perceived exposure (2) PHRs (3) benefits, and (4) barriers of being protected, were considered as exogenous to conceptualize health-protective behavior (Cao et al., 2014). Moreover, the proposed model also hypothesized the role of self-efficacy, which is an integral part of HBM, as suggested by Champion and Skinner (2008) and Jones et al. (2015) who proposed that media and SSEs are novel contributions. The study showed the role of Urban and Kujinga's (2017) view of regulatory and normative support as cues to act in the setting of HBM. Within the HBM, the current study stretched the spectrum of self-efficacies and proposed a new view to examine the cues to act, because both of these attributes need more exploration to maximize the explanatory power of the HBM, as discussed by Jones et al. (2015).

In the view of HBM, perceived exposure (Exp) to any health issue can be considered as the trigger of human cognition and behavioral change (Rosenstock, 1974). Tajeri et al. (2020) stated perceived exposure as the degree of sensitivity to the situation, where the higher chances of being exposed push individuals to conceptualize the health risk. Zampetakis and Melas (2021) mentioned PHR as an individual's perceived potential adverse consequences if the protective measures are ignored (Zampetakis and Melas, 2021). In the case of COVID-19, HBM implies that the higher sense of exposure and a greater degree of perceived risk can lead to compromising circumstances for the psychological well-being (i.e., anxiety and depression) if the coping strategies (i.e., social support) are not adopted in an effective manner (Zvolensky et al., 2020). The adopted theoretical stance argues that a greater sense of exposure helps individuals quantify risk in a more proactive manner to adopt preventive measures (i.e., vaccination; Carico et al., 2020). Hence, the current research proposed the following hypotheses.

*H*1: Perceived exposure influences the PHRs.

*H*2: PHR influences the health-protective behavioral intentions.

Zhou et al. (2021) stated that risk perception mediates the individuals' judgment while mapping certain health risks, i.e., severity or susceptibility of exposure. They further emphasized that self-efficacy can play a strategic role in formulating susceptibility, severity, exposure, risk perception, and health-protective behavior. However, self-efficacy is less studied compared with the rest of the HBM's constructs (Rosenstock et al., 1988; Zhou et al., 2021). MSE (Chen et al., 2020) and SSE (Yang et al., 2020) are also recorded as significant determinants to map an individual's cognitive and behavioral change during COVID-19. Thus, the following hypothesis was proposed in the current research.

*H*3: (a and b): Perceived exposure influences an individual's MSE and SSE.

Fundamentally, MSE comprises the ability to operate media (platform) and the attributes to access, understand, and interact with media (Hammer et al., 2021). Nur et al. (2016) argued that people know about the world through media. An individual's confidence in accessing, analyzing, evaluating, interacting, and participating is related to media content. In the context of the current pandemic crisis, trust in media has been recorded as a significant construct that defines public health-protective behavior (Niu et al., 2021). Moreover, the source of information also helps define risk perception and related health-protective behavior (Wang et al., 2021). The challenge of MSE in the current pandemic is complex, because the impacts of international and domestic media sources vary in terms of the effect on society (Su et al., 2021). Therefore, the following hypothesis was proposed.

*H*4: MSE influences health-protective behavioral intentions.

SSE describes the individual's ability to use scientific knowledge and understanding to assess and evaluate scientific information and arguments (National Research Council, 1996). Fasce and Picó (2019) argued that scientific thinking ability (efficacy) refers to the understanding of scientific theories, trust in science, and critical thinking. The literature argues that SSE can help an individual cope with cognitive anxiety, because it helps in the development of science engagement and is more effective in an informal setting (Yang et al., 2020). In the context of the COVID-19 pandemic crisis, the literature argues that greater belief in science helps an individual adopt positive health-protective behavior (i.e., wearing a mask; Stosic et al., 2021). Moreover, scientific communication with justification and multilingual support during COVID-19 can be considered as effective measures (Taragin-zeller et al., 2020). Thus, the following hypothesis was proposed in the current research.

H5: SSE influences health-protective behavioral intentions.

In health-related behavioral research, the perceived benefits of being protected have a significant impact on the definition of health-protective behavior (Wu et al., 2021). The benefits of being protected as a part of belief can positively influence the health-protective behavior (Becker et al., 1978). Almazyad et al. (2021) concluded that the benefits of being protected are the third most significant construct after perceived exposure and self-efficacy during COVID-19. Similar findings were recorded by Shahnazi et al. (2020), who showed the strategic role of benefits of being protected while mapping motivations to take preventive measures during COVID-19; benefits of being protected also help reduce the psychological barriers of being protective. The perceived barriers of being protected can be labeled as a subjective assessment of the costs or obstacles to the given health-protective behaviors (Didarloo et al., 2017).

Barriers of being protected is a critical variable for forecasting health-protective behaviors in the existing literature. Jeong and Ham (2018) indicated that perceived barriers negatively influence the customers' behavior. Similarly, Hu et al. (2017) stated that barriers of being protected negatively affect seasonal influenza vaccine acceptance. Interestingly, the studies emphasized that the role of barriers of being protected in the case of COVID-19 was recorded with mixed perceptions. For instance, mental health can be captioned as a double-edged sword in the pandemic; it can consistently be a barrier and a motivator to adopt health-protective measures, e.g., avoiding physical activities (Marashi et al., 2021). Zhao and An (2021) argued that barriers of being protected are weakly significant constructs to define health-protective behavior. Therefore, the following hypotheses are proposed in the current research setting.

*H*6: Benefits of being protected influences health-protective behavioral intentions.
*H*7: Barriers of being protected influences health-protective behavioral intentions.

Cues to action are among the least addressed and underdeveloped constructs in HBM (Champion and Skinner, 2008; Jones et al., 2015), and they demand more attention, because they can have internal (intrinsic) or externally (extrinsic) driven factors that can be manipulated (i.e., through biased reporting on social media) or are naturally occur (factual record). In the context of COVID-19, several researchers emphasized the role of cues while conceptualizing health-protective behavior (Walrave et al., 2020; Tsai et al., 2021). Literature also reported that cues to act in social media can trigger compromising circumstances for social and psychological well-being in society (Chao et al., 2020; Xue et al., 2021). Interestingly, in some cases, institutions and regulatory authorities' cues are also significant to the implementation and practice of health-protective behavior (Al-Sabbagh et al., 2021). Hence, the current study proposed the following hypotheses by revisiting the role of "cues to act" in HBM and adapting Urban and Kujinga's (2017) view of "regulatory and normative support."

*H*8: Regulatory cues moderated the relationship between PHRs and health-protective behavioral intentions.
*H*9: Normative cues moderated the relationship between PHRs and health-protective behavioral intentions.

MATERIALS AND METHODS

Measurement Scales

Conceptually, the designed quantitative survey comprised two subsections. The first subsection aimed to frame the demographic profiling of respondents and includes questions about the age, gender, education, most preferred source of information to find updates about COVID-19, and frequency of news received every day during the COVID-19 pandemic. In the second subsection, the constructs' related items, specifically those adopted from the existing sources to avoid the instrumental reliability and validity issues, were listed. All constructs' related items were scored using the seven Likert scales, in which a higher score indicated a higher degree of agreement with the statement. To ensure the reliability-related challenges, specifically in the case of Chinese natives, the designed instrument was back-translated, because the constructs were initially adopted from sources in English. The instrument was translated into Chinese and then reverse-translated to English with the help of different volunteer participants. Both English versions were compared and revised to deal with the challenge of instrumental validity, as suggested by Brislin (1970). Moreover, the instrument was revised to address language-, content-, and layout-related issues after a pretest. The revision was conducted by three faculty members from the School of Humanities and Social Sciences (University of Science and Technology of China) and two health experts to evaluate the relevancy and validity. The faculty members have expertise in behavioral mapping. The adopted questionnaire is listed in **Appendices A** and **B**.

Collecting Data

To map the perceived health concerns and factors affecting health-protective behavior of sojourners and natives in China, an online quantitative survey was conducted during the second and third quarters of 2020 with the help of a digital survey platform WJX.[1] This is a reliable data collection source in Mainland China (Sajjad et al., 2020). Specifically, the individuals who stayed in Mainland China during the timespan of the COVID-19 outbreak were taken as eligible respondents for the study. These included the natives and the sojourners (students, employees, or family-dependent individuals). The lucky draw of an amount ranging from RMB 1 to 5 RMB (RMB 1 = USD 0.14) was offered to the potential participants to speed up the data collection pace. The final version was distributed among more than 900 eligible individuals through WeChat. However, only 598 filled responses were received, whereas 163 response sets were excluded due to their incompleteness. The incomplete responses were the outcome of the data collection condition. Respondents were restricted from skipping questions. Therefore, incomplete responses can be the result of leaving the questionnaire resurvey in the pipeline. Non-response biases calculated by the Wilcoxon rank-sum tests helped gauge the difference between the collected sample responses during the second and third quarters of 2020. No significant difference was found among the subsets of the responses noted. The demographic profile of the collected sample is listed in **Table 1**.

Variation of Responses

The study comprised a single quantitative approach for behavioral modeling, as proposed in the study. To avoid instrument bias, Harman's single-factor assessment was performed to measure the maximum variance among the proposed constructs, as suggested in the existing literature. Expressly, in the overall model, the maximum variance by single factor was 29.045.

[1]www.wjx.cn

TABLE 1 | Demographic profile of respondents.

Characteristic		Chinese natives (241)	Sojourner in China (194)	Overall (435)
Gender	Male	153	137	290
	Female	88	57	145
Education	Attended Vocational School	27	-	27
	Attended School / College	161	38	199
	Attended University	53	156	209
Age	Under 25	32	13	45
	25–35	193	149	342
	Above 35	16	32	48
The preferred source of information in the case of COVID-19	Newspaper or Radio	08	-	08
	Television	77	-	77
	Internet (Web only)	43	98	141
	APP, i.e., Wibo, WeChat	61	73	134
	Friends circle	52	23	75
Frequency of COVID-19-related news read/received every day (news/incidents)	1–3	68	77	145
	4–5	84	63	147
	More than five	89	54	143

TABLE 2 | Internal reliability testing for the OVERALL collected sample.

Construct	Items	Loadings	α	CR	AVE
Exposure	3	0.851–0.926	0.912	0.962	0.894
Perceived health risk	3	0.862–0.938	0.940	0.940	0.842
Media self-efficacy	3	0.864–0.917	0.925	0.944	0.857
Benefits of being protected	3	0.841–0.932	0.945	0.946	0.853
Scientific self-efficacy	3	0.824–0.904	0.935	0.935	0.877
Barriers of being protected	3	0.892–0.914	0.922	0.921	0.895
Health-protective behavior	3	0.847–0.931	0.953	0.943	0.872
Normative cues	4	0.867–0.907	0.944	0.913	0.938
Regulatory cues	4	0.812–0.918	0.937	0.947	0.849

The lower cutoff value for AVE is 0.5; least acceptable value for loadings, ρ_A, Cronbach alpha is 0.7 as noted in Gelhard and von Delft (2016) and Hair et al. (2010).
Exp, Exposure; PHR, Perceived Health Risk; MSE, Media Self-Efficacy; SSE, Scientific Self-efficacy; BaBP, Barriers of Being Protected; BeBP, Benefits of Being Protected; NC, Normative cues; RQ, Regulatory cues; AVE, Average Variance Extracted; ρ_A, Dijkstra-Henseler's rho; α, Cronbach Alpha; CR, Composite Reliability.

Furthermore, the common latent factor (CLF) measured as suggested by Song et al. (2019). The standard regression scores of a model with and without CLF were compared. However, no difference was recorded above 0.200. Therefore, the quantified results eliminated the issue of CMB in the research.

ANALYSIS

The research used structural equation modeling (SEM), where the variance-based approach was adopted. Notably, partial least-squares (PLS) was performed for hypotheses testing, as proposed in Section 3. The statistical tool "ADANCO v2.0.1" was used to compute the estimated and proposed models. PLS was performed, because (1) it helps test model fitness (2) it is preferred for estimating models, and (3) the existing pool of literature encourages the use of PLS for behavioral modeling. To examine the model fitness in further detail, the fitness indices from AMOS-SPSS were also taken into account. Specifically, measurement evaluation was performed on the overall model. However, the path analysis for each of the subgroups was examined in further detail during the structural path analysis.

Measurement Evaluation

The explanatory factor analysis (EFA) was performed to examine the internal and external reliability of the constructs. In particular, the instruments' Cronbach alpha (α), composite reliability (CR), Dijkstra–Henseler's rho (ρ_A), and average variance extracted (AVE) were computed. All scores obtained during the EFA were recorded above the least acceptable value, as shown in **Table 2**. Moreover, the satisfactory results were also computed in the case of each subgroup.

Fornell and Larcker (1981) and Hetro and Monotrait ratio of correlation (HTMT) approach for the computation were used to measure the external reliability of the constructs. Notably, in Fornell and Larcker's approach, the correlation scores were recommended to be lower than the AVE's square root scores (Fornell and Larcker, 1981). For HTMT, the correlation score was advised and recorded below 0.90 (Henseler et al., 2014). The satisfactory discriminant reliability scores were recorded in the overall mode and in each subgroup (natives and sojourners in China). Thus, no traces of homological issues were observed while computing the external validity. The results are presented in tabular form in **Appendix C** Meanwhile, multicollinearity was tested by computing the variance inflation factor (VIF) for each item of the proposed constructs. All observed items' VIFs were lower than the upper cutoff limit, as recommended by Petter et al. (2007). Moreover, the country-level multicollinearity was also recorded within the acceptable limits. Thus, no multicollinearity issue was recorded in the current research.

Overall Fitness

The research measured the fitness of the proposed model by calculating the standardized residual scores (SRMR; i.e., its square root mean values) and unweighted discrepancy (i.e., its

TABLE 3 | Model fitness recorded through AMOS-SPSS.

	Models	CMIN	df	CMIN/df	Non-Centrality		Relative		Absolute	
					CFI	RMSEA	TLI	NFI	GFI	AGFI
	Preferred cutoff			5.0*	≥0.950*	≤0.08*	≥0.950*	≥0.950*	≥0.900*	≥0.800*
1	Overall model	504.699	167	3.022	0.975	0.068	0.969	0.963	0.908	0.873
2	Natives in China	395.213	167	2.367	0.971	0.075	0.964	0.952	0.869	0.818
3	Sojourners in China	340.998	165	2.067	0.971	0.074	0.963	0.945	0.872	0.821

Recommended limits by Hu and Bentler (1999).

TABLE 4 | Path analysis for overall model and subgroups (sojourners vs. natives).

Sr.	Hypotheses	Beta (regression scores)		
		Overall model	Natives in mainland China	Sojourners in mainland China
H1	Exp →PHR	0.635***	0.512***	0.730***
H2	PHR→HPB	0.134*	0.096*	0.175**
H3a	Exp→MSE	0.593***	0.557***	0.634***
H3b	Exp→SSE	0.642***	0.599***	0.706***
H4	MSE→HPB	0.276***	0.435***	0.202*
H5	SSE→HPB	0.214**	0.205*	0.175*
H6	BeBP→HPB	0.133*	0.067*	0.166*
H7	BaBP→HPB	0.022 ns	0.032 ns	0.041 ns
H8	RQ * PHR→HPB	0.090***	0.107**	0.060 ns
H9	NC * PHR→HPB	0.106***	0.069 ns	0.134***

*Exp, Exposure; PHR, Perceived Health Risk; MSE, Media Self-Efficacy; SSE, Scientific Self-efficacy; BaBP, Barriers of Being Protected; BeBP, Benefits of Being Protected; NC, Normative cues; RQ, Regulatory cues. *p < 0.05; **p < 0.01; ***p < 0.001.*

dULS-least squares and dG-geodesic scores). The smaller scores for standardized residual values signified the fitness of the proposed model (Henseler et al., 2016), as listed in **Appendix D**. Apart from PLS-based fitness scores from ADANCO, model fitness indices from AMOS-SPSS v24.0 were also considered to ensure the model fitness of the proposed model, as shown in **Table 3**. All fitness indices in the overall model and in each subgroup were recorded as significant, as suggested by Hu and Bentler (1999), except the NFI score in sojourners in China, and GFI scores in each subgroup. However, these three values were also supported and considered acceptable, as suggested by Belanger and Carter (2008). Thus, all fitness index scores from AMOS-SPSS supported the fitness of the proposed model.

Hypotheses Testing

With the support of ADANCO v2.0.1, the structural model-related hypotheses were tested in the overall model and subsets (natives and sojourners in China), as proposed in Section 3. In the following subsection, the findings from the overall model and from the subgroup are discussed in detail.

Overall Model

In the overall model, all proposed hypotheses in the structural model were observed to be significant and supported except in the case of H7, where the perceived barriers of being protected were noted as nonsignificant. These observations were performed while mapping the overall model to define the health-protective behavior during the pandemic (COVID-19) in mainland China, as shown in **Table 4**. Moreover, the control variables (age and education) were noted as nonsupported. The total variance computed through the proposed constructs (R^2) for MSE, PHR, SSE, and health-protective behavior for the overall model were 35.2, 40.3, 41.3, and 60.7%, respectively, in the overall model. The study computed the path significance (ρ-value) and coefficient scores (β) for the hypotheses declared in Section 3. The perceived exposure was recorded with a strong positive influence on the PHR (H1: $\beta = 0.635$, $\rho < 0.05$), and a similar trend was suggested by Shahnazi et al. (2020). The findings also concluded that PHR significantly affected the health-protective behavior (H2: $\beta = 0.134$, $\rho < 0.05$), and a similar trend was discussed by Carico et al. (2020). Moreover, perceived exposure was also observed as a significant influencer of the proposed efficacies, particularly the MSE (H3a: $\beta = 0.593$, $\rho < 0.05$) and SSE (H3b: $\beta = 0.642$, $\rho < 0.05$). These findings were aligned with the existing literature, in which efficacies helped formulate protective actions and responses to the pandemic crisis (Rui et al., 2021).

MSE (H4: $\beta = 0.276$, $\rho < 0.05$) and SSE (H5: $\beta = 0.214$, $\rho < 0.05$) showed a significant impact on the definition of health-protective behavior, which was in line with the existing pool of literature (Niu et al., 2021; Stosic et al., 2021; Wang et al., 2021). Furthermore, the benefits of being protected were observed to be significant in the overall model (H6: $\beta = 0.133$, $\rho < 0.05$), as suggested by Al-Sabbagh et al. (2021) and Zampetakis and Melas (2021). However, the nonsignificant relationship between the perceived barriers of being protected and health-protective behavior (H7: $\beta = 0.022$, $\rho > 0.05$) highlighted the seriousness of the current pandemic crisis and the urgency to address the misaligned gap by improving effective communication with the citizens. Zhao and An (2021) also observed the weak relationship of the barriers of being protected with the health-protective behavior in a recent study.

The moderating effect in the H8 and H9 was computed with the help of the hierarchical regression model. The findings concluded that the regulatory cues (H8: $\beta = 0.090$, $\rho < 0.05$) and normative cues (H9: $\beta = 0.106$, $\rho < 0.05$) significantly affected the perceived health-protective behavior. A similar trend of findings was seen in the recent pool of literature, in which the government institutions were noted as significant determinants in defining public preventive behavior in China (Min et al., 2020).

Moreover, social influence during the time of COVID-19 was identified as a strong predictor to define public consumer behavior, i.e., panic buying as a part of protective behavior (Naeem, 2021). The interaction plots used to visualize the moderating analysis are listed in **Appendix D**.

Natives vs. Sojourners in Mainland China

In the comparison of the natives and sojourners in China, brief psychological profiles of natives and sojourners were extracted from the current findings. All hypotheses in the proposed setting were significant, except for the role of barriers of being protected in the definition of individuals' health-protective behavior in both cases (sojourner and natives). Moreover, education in the case of sojourners was noted as the only control variable that was recorded as significant. While defining PHR, the perceived fear of susceptibility and severity of COVID-19 in terms of exposure were found to have a greater effect on natives than on sojourners. The comparatively high concern of being exposed can be related to the panic among migrants (including sojourner; Ullah et al., 2021), as every responsible government is imposing safety measures to deal with COVID-19. The perceived exposure (concern) had a more significant impact on individuals' media and SSE among sojourners than among natives. The current findings can be argued on the basis of the descriptive profile of the respondents, as most of the sojourners rely on digital media and attend academic institutions for their tertiary-level education. The graphical explanation of the proposed model in case of sojourners and natives is shown in **Appendix D**.

While mapping the exogenous factors to define perceived health-protective behavioral intentions of sojourners and natives in mainland China, the findings revealed that MSE is the strongest determinant in both cases. In-person communication has been replaced with digital medium and also drives a few challenges, i.e., COVID-19-related information overload (Song et al., 2021) and digital exclusion of nondigital natives and migrants (Nguyen et al., 2021). Thus, this finding signifies the sensitivity of MSE. Furthermore, the SSE was a slightly stronger determinant among natives than among sojourners. The findings are in line with those obtained in Flynn Murphy's article in *Nature* (Murphy, 2020), where the capable medial workforce in China contributed to digital media as a scientific communicator to explain COVID-19 and communicate related health-protective initiatives with citizens. The PHRs from COVID-19 and perceived benefits of being protected were two-fold stronger determinants for defining perceived health-protective behavior among sojourners than among the native Chinese. This pattern of findings can potentially lead to a future study, in which the role of national culture can be taken into account. China, with its traditions and value of collectivism, was the first country to ask its citizens to wear masks, whereas the Western region was still confirming the effectiveness of mask-wearing practice by conducting clinical trials and research (Zurong, 2020); this information was intentionally ignored in the current research.

An interesting pattern can be obtained by analyzing the role of regulatory and normative cues to act among sojourners and natives. Specifically, regulatory support observed significant factor as a cue to act in the Chinese population, as suggested by Liu et al. (2020). However, sojourners mostly relied on cues from social networks (normative setting) only. Literature argues that more than 60% of the foreigners in China accessed COVID-19-related information through international sources (Chen and Liu, 2020), which can help portray sojourners' nonsignificant absorption of regulatory cues. The interaction plots in case of moderation analysis are listed in **Appendix D**.

IMPLICATIONS

The current research signifies the role of scientific and MSE and the crucial role of regulatory and normative cues while conceptualizing health-protective behavior of sojourners and natives in China. In terms of implications, the following theoretical and practical implications can be extracted from the current research.

The current research has several theoretical implications. First, the current research can distinguish results on the basis of its theoretical stance, as the proposed model for the study was adopted from HBM (a psycho-sociological model). It can predict and understand individuals' health-protective behavioral intentions. Simultaneously, two primary pillars are adopted from IT, where the normative and regulative support are used to revisit the role of cues to act in the HBM: in particular, the adoption of regulative and normative support intended to address one of the least studied sections of HBM, as stated in the literature. Therefore, the study contributes its unique stance to the existing literature on HBM.

Second, besides the adaption of factors from IT, self-efficacy as a construct is also revisited. The current research proposed the critical role of media and SSE as determinants of perceived health-protective behavioral intentions during COVID-19. Theoretically, this revisiting of self-efficacy as a construct can be a part of a social cognitive theory or as an empirical research-based initiative to deepen the understanding and effectiveness of HBM. The current adopted view of self-efficacy can be suggested to examine health-protective behavioral intentions of digital natives or migrants or in the digital sphere of social setting.

Moreover, several research initiatives have studied the physical and psychological effects of outbreaks of severe infectious diseases according to different demographic variables, e.g., whether examining individuals from specific socio-economic settings or behavioral mapping in case of a specific segment of society on the basis of their demographic attributes. However, no studies have been performed on the physical and psychological impacts of outbreaks of COVID-19 on sojourners and natives. No research initiative ever tried to compare the efficacies or the impact of different cues to action among sojourners and natives in any particular setting.

Apart from the theoretical contributions of the current research, the findings of sojourners' and natives' health-related behavior during COVID-19 in the Mainland China have some practical implications that can be potentially generalized globally.

First, the comparatively unequal effect of normative and regulatory support in case of sojourners and natives was recorded. The perceived effectiveness and sense of connectivity between institutions and individuals in dealing with pandemic crisis differed between natives and sojourners. The literature argues that migrants (including sojourners) usually feel more insecure and panicked during an infectious disease epidemic. Specifically, the nonsignificant impact of regulatory cues' implies that the gap between institutions and individuals is comparatively high in the case of sojourners. Therefore, the findings imply that effective communication with sojourners can be a future area of concern for researchers, academicians, and policy makers, especially in China, where foreign-attractive reforms are in the early stage. For instance, one of the most constructive measures is the use of a multilingual or multimode communication mix, in which maximum interaction with sojourners becomes possible for institutions during the crisis. In terms of stakeholders' management, the institution's primary responsibility is to mobilize and involve each member of the society to make the crisis management strategy successful and effective.

Moreover, the theoretical implication to embed media and SSE in HBM also stretches the practical implications further. MSE was recorded as the most dominating construct in the overall model and in the case of natives and sojourners separately. Thus, MSE is a critical attribute in any scenario of a crisis control initiative. In recent years, the digital attributes of media allowed the creation of new perspectives of information-seeking and sharing behaviors in society, i.e., the pull architecture of the internet always brings much information to an information seeker. Furthermore, as discussed in Section 3, international and domestic media sources influence information seekers differently during the COVID-19 pandemic in mainland China. Therefore, the current study implies that the efficient and effective use of media by concerned institutions can help communicate information to sojourners and natives in a more digitally smart and effective manner i.e. the use of immersive media in risk communication. The study highlights the critical role of SSE, because it helps conceptualize individuals' risk perception in any emergency crisis. The presence of a science museum in every populous city in China is a part of the national strategy to increase the public's understanding of science and its impact on society. The significance of SSE implies that the use of science communication in a more informal manner during a pandemic is important. Lastly, sojourners are supposed to be ambassadors who can communicate with international entities. Therefore, the gap between the PHR and protective behavior must be minimized to avoid spreading international propaganda.

CONCLUSION AND FUTURE STUDIES

The current research initiative was proposed to a persuasive psychological model to conceptualize the health-protective behavior of sojourners and natives in Mainland China during the COVID-19 pandemic crisis. The study made a theoretical contribution by addressing the role of media and SSE in health-protective behavioral intention modeling. Moreover, the role of regulatory and normative cues was also stretched further using the existing HBM. The possible list of future research fronts may include the following: (1) holistic communication strategy in a pandemic, especially in the presence of a communication barrier (i.e., multilingual support); (2) the role of efficacies need to be explored further, because they classify human cognitive abilities, i.e., how self-resilience and cognitive abilities help mitigate the pandemic situation; (3) the nonsignificant impact of regulative cues in sojourners highlights the need to improve sojourners' understanding to distinguish the cues from institutions and society; (4) in terms of the public's understanding of socio-scientific issues, the role of SSE should be emphasized and revisited; (5) the role of the trust in technology and in institutions, as well as the social capital in terms of individuals' social networking, should be examined to map sojourners' and natives' health-protective behavioral intentions in routine life and under unique circumstances (i.e., pandemic situation).

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

FA and MA: conception and design of study. QY: acquisition of data. AS and MA: analysis and/or interpreting data. FK: drafting the manuscript. All persons who have made substantial contributions to the work reported in the manuscript. All authors contributed to the article and approved the submitted version.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.664399/full#supplementary-material

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The Role of Social Media in an Inspirational Approach to Product Design and Designer Performance

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Social media has encouraged a large number of organizations to design their work patterns to facilitate their employees through social media adoption. This study examines the effects of enterprise social media and public social media on the novelty-focused product design, and efficiency-focused product design that eventually explain the performance of the designers. Empirical analysis based on time-lagged, multi-source data set indicate that both enterprise social media and public social media are an important source of product designer's inspiration which are positively related to novelty-focused design and efficiency-focused product design. Results further indicate that efficiency-focused product design has a stronger impact on designer performance than novelty-focused design. Theoretical implications and practical implications are discussed in the later sections.

Keywords: novelty-focused product design, efficiency-focused product design, designer performance, enterprise social media, public social media

INTRODUCTION

Over the past two decades, an increasing number of organizations are adopting social media to support creativity and innovation to enhance product performance (Vuori et al., 2012; Bharati et al., 2015; Myers, 2015). Social media is playing a critical role in supporting innovation-driven organizational strategies, therefore, recent studies are investigating how social media platforms have affected product and service performance (Li et al., 2018; Islam et al., 2021). However, for social media to affect product performance through innovation requires individuals to differentiate their intentions in product designing. For example, social media is a dominant contributor to designing efficient and innovative products to satisfy consumer needs (Rathore et al., 2016). A large amount is invested by the companies to leverage social media to support its employees. Expecting to realize efficient and innovative product designs that can help gain market share. However, the expected value of a company's investment in social media is often not realized (Cao and Ali, 2018; Yu et al., 2018), creating a challenge for the firm to adopt appropriate strategies to support employees in creating novel products.

Despite the fact that many researchers have looked at the impact of social media on internal organization interaction among individuals, and teams (Sherf and Venkataramani, 2015; Hu et al., 2018; Bao et al., 2020; Liang et al., 2020), and external interaction with customers (Islam et al., 2020; Zafar et al., 2021), we still have limited knowledge of the role of social media. Specifically, there is limited empirical research that provided information on how the use of social media affects product design (D'Andrea et al., 2015). Product design can be categorized into novelty-focused product design (NFPD) and efficiency-focused product design (EFPD) (Gerwin and Barrowman, 2002; Micheli and Gemser, 2016). The two product designs are not mutually exclusive. Rather, both can be part of any product design at the same time. However, due to the designer's unique design orientations, both NFPD and EFPD are critical sources of product success. Although, organizations and individuals use social media to help communicate with co-workers, and customers to improve product design (D'Andrea et al., 2015; Do, 2016; Rathore et al., 2016), yet, how social media use affect NFPD and EFPD remains a challenge.

In organizations, employees not only use enterprise social media platforms, but also use public social media platforms to interact with potential customers (Ali et al., 2019a; Wei et al., 2020), and gain resources to facilitate their product design. Social media is used by employees for their work-related purposes and social related purposes simultaneously (Cao and Yu, 2019; Liang et al., 2020). Besides, studies have suggested that employees use both enterprise social media, as well as public social media platforms to satisfy their needs (Cao et al., 2012, 2016; Laitinen and Sivunen, 2020). Accordingly, employees use enterprise social media, and public social media to satisfy their needs. However, enterprise social media alone cannot always satisfy their work-related needs, for instance, organizations often face budgetary challenges to provide extended social media facilities. In addition, potential customers and professionals having useful knowledge may reside outside the enterprise social media networks. Thus, public social media platforms are considered a useful resource-generating facility for employees engaged in product designing (Gregg, 2010; Yang et al., 2021). Therefore, we contribute to the research on social media and extend the literature by investigating the simultaneous role of enterprise social media and public social media to support NFPD and EFPD.

This study builds on organizational learning (OL) theory (Real et al., 2006) to investigate the link between two types of social media platforms used by employees and product design, which eventually explain designer performance. The OL theory states that different practices that enable performance rely on learning practices. Thus, we suggest that the development of NFPD and EFPD will need unique social media capabilities. Since, enterprise social media, and public social media enable employees to interact, communicate, exchange ideas, share knowledge, and understand potential customers (Choi, 2019; Ali et al., 2020a; Cao et al., 2020; Laitinen and Sivunen, 2020), we argue that two types of social media platforms could support NFPD and EFPD, which consequently enhance the performance of the designing employee.

This research adds to the existing body of knowledge in at least three ways. First, this research adds to the body of knowledge about social media by explaining the complex linkage between social media use, product design. Second, we investigate the link between a particular social media platform (enterprise social media and public social media) with the product design focus of the employees (NFPD and EFPD). Third, our study theoretically based on the OL theory highlights the role of social media platforms on design employee's performance through NFPD and EFPD. Thus, this study provides novel insights into how different focus of designers can explain their value and contributions for the organizations.

THEORETICAL BACKGROUND AND HYPOTHESES

Organizational Learning Theory

OL theory suggests that learning provides a foundation to develop distinctive capabilities, which eventually enable higher performance outcomes (Real et al., 2006). More precisely, it indicates that learning is a dynamic process that includes acquiring, sharing, transforming, and applying knowledge in a way that facilitates improved services and products (Kane et al., 2014). OL theory further suggests that knowledge exploration and knowledge exploitation are two main components of the learning process through which employees acquire, exchange, develop, and use knowledge where needed (Kane and Alavi, 2007).

The literature on knowledge exploration and knowledge exploitation recognizes the use of information technology and suggests that information technology such as social media has important implications for knowledge management processes and learning activities (Alavi and Leidner, 2001; Benitez et al., 2017; Ali et al., 2020b). More recently, researchers have discovered that using social media improves knowledge management, creativity, and performance (Davison et al., 2018; Khan et al., 2019; Wei et al., 2020). For instance, Cao et al. (2020) noted that social media use facilitates team knowledge creation and performance. Ali et al. (2020a) found that social media facilitates knowledge exploration and exploitation of team members, leading to improved innovative solutions. Thus, this study in line with previous literature suggests that social media use may positively facilitate designers in developing NFPD and EFPD. Particularly, we propose that enterprise social media and public social media, both are related to NFPD and EFPD by designing employees. The study's conceptual model is shown in **Figure 1**.

The literature on product design has suggested that product design is a social process in which different actors (i.e., employees, customers, and distributors) are involved. The involvement contributes to a product design that is novel and efficient to satisfy user needs. Involvement of potential customers, for example, may enable designers to come up with new features

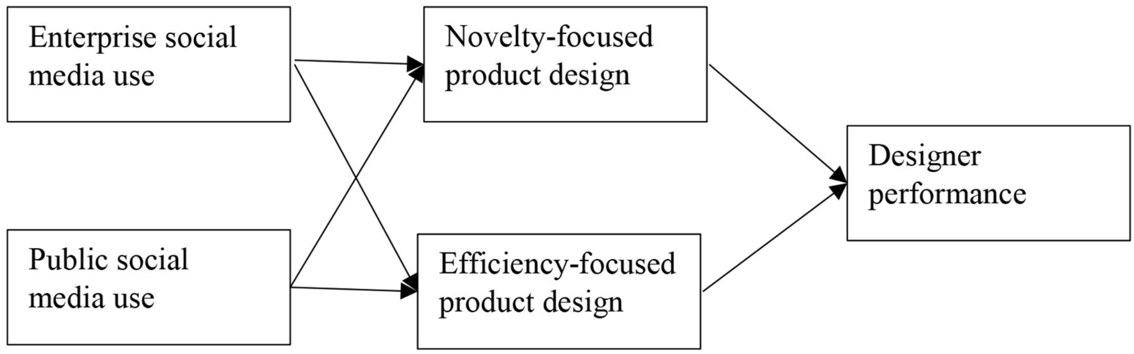

FIGURE 1 | Conceptual model of the study.

and fixtures, enhanced product quality and size, renewal of existing product design according to the needs of the customers, and understanding the durability and creative design needs of the end-users. D'Andrea et al. (2015) noted that using social media to engage customers enables better product design and features that increase product performance (Yang et al., 2019). Therefore, enterprise social media, and public social media both are important technological platforms that contribute to product design that is novel and efficient, that eventually explains the performance of the employees designing the product.

Social Media Use and Product Design

Enterprise social media use as a technological tool enables interaction, communication, and knowledge exchange among organizational members may help product design (Laitinen and Sivunen, 2020; Ma et al., 2020; Wei et al., 2020). We propose that enterprise social media use supports NFPD and EFPD. Firstly, enterprise social media use facilitates designers to access diverse knowledge from organizational members for improving design novelty in product designing (Ali et al., 2020b). It provides more resources, ideas, and content that helps designers re-think the product with novel insights (Wagner et al., 2014). Accordingly, designers can generate novel ideas in designing and producing products. For example, Ali et al. (2020a) found that the use of enterprise social media enables employees to acquire knowledge resources and integrate those resources to generate novel ideas for products and services. Accordingly, we propose that the use of enterprise social media enables NFPD development.

Secondly, enterprise social media can also facilitate EFPD. For instance, discussion with colleagues from other departments, such as sales and marketing, manufacturing gives access to alternative knowledge, and market insights (Moqbel and Fui-Hoon Nah, 2017; Aboelmaged, 2018; Ali et al., 2021), which lends new perspectives to understand existing product designs. Thus, employees engaged in designing products can reevaluate existing product design, eliminate defects, and increase the efficiency in their product design, leading to increase product use and reducing manufacturing cost, while enhancing user satisfaction. In this way, designers can simplify product design, and transform design according to the requirements of the manufacturing, sales, and marketing departments who have close contact with customers. Thus, we propose that the use of enterprise social media will facilitate designers in a way that enables them to generate EFPD. In summary, we develop the following hypotheses.

H1: Enterprise social media use is positively associated with novelty-focused product design.
H2: Enterprise social media use is positively associated with efficiency-focused product design.

Similarly, we argue that public social media platforms are enablers of exploration and exploitation of knowledge leading to facilitate designers in developing innovative and efficient product designs. Firstly, enterprise social media extends knowledge exploration by increasing interaction with external resources of knowledge and ideas (potential customers) (Cao et al., 2020; Naeem and Ozuem, 2021). The utilization of public social media platforms improves the knowledge acquisition from external knowledge stocks to the organization, providing an opportunity to integrate with internal knowledge to generate innovative ideas that could satisfy customer expectations (Peppler et al., 2011). Thus, using public social media, designers are enabled to recombine and refine existing internal knowledge resources generated through using enterprise social media, and face-to-face interaction with co-workers, to create a new knowledge base that is useful to develop novel content of the product design. For instance, comments from the customers on a social commerce site e.g., Taobao may help designers to consider reviewing product design according to the needs of the customers. Thus, we propose that public social media usage helps designers to acquire and integrate their knowledge and ideas to create NFPD.

Secondly, the use of public social media can support EFPD through enhanced interaction with potential customers and end-users. Public social media increases the designer's interaction with potential users of the product, which enables a designer to resolve design issues in close interaction with customers, which helps improve the efficiency of the product design. In this regard, public social media platforms facilitate timely and accurate information and feedback of the customers for the product designers, to understand each other, which reduces design uncertainty for both designers and consumers, thus enabling EFPD. In summary, we hypothesize that

H3: Public social media use is positively associated with novelty-focused product design.
H4: Public social media use is positively associated with efficiency-focused product design.

Product Design and Designer Performance

A product design is a blueprint for the value creation of market opportunities through the design of a product that is innovative and efficient to satisfy customer needs. Previous studies have focused on two main themes of product design which are NFPD and EFPD (Gerwin and Barrowman, 2002; Micheli and Gemser, 2016). NFPD focuses on designing a product that is creative and useful for the end-user, whereas, an EFPD focuses on efficient product design that is cost-effective for organization, as well as provide durable product with low cost to the customers. Two of the product design themes are not mutually exclusive, yet, depending on the organization and customer preferences, both may have a unique contribution toward customer satisfaction and eventually designer performance. Thus, focus on a particular design them is critical for the organization as it enables an organization to attract customers and ensures customer retention that is key in the current global business scenario.

Product and service design is an important factor for enhancing customer satisfaction and loyalty (Pereira et al., 2019), which define the performance of a product designer at the micro-level (Nazari-Shirkouhi and Keramati, 2017) and organizational performance at a macro level (Micheli and Gemser, 2016). Especially, NFPD can create new business opportunities, and give increase designer scope to suggest products with unique design features, which positively affects organizational performance. Firstly, NFPD enables designers to create value for the customers by providing them novel features and designs (Moon et al., 2015). A novel product creates social value for the customers and thus increases their satisfaction with the product while increasing their loyalty to the organization. In this way, designers can create the first-mover advantage for the organization and increase customer value. In addition, through NFPD, a designer may also enable organizations to satisfy customers by providing them with a novel product that is not easily acquired from other organizations. Thus, the NFPD focus of a designer helps organizations increase customer satisfaction through offering novel products that are not useful and unique from other products of competitive organizations. Together, opportunities created by the designers focus on the NFPD is expected to create value for the organization by creating a pool of satisfied and loyal customer, which also explain contributions of the designer and hence his performance.

EFPD on the other hand can also enhance the value and performance of a designer for the organization by enabling him to create a product that is lower in cost while maintaining the quality and features. EFPD encourages increased information flow among different departments of the organization and simplified designing and manufacturing processes so that the cost of the product is reduced. Therefore, designers can develop product designs that are coordinated with manufacturing, finance, and sales and marking departments to minimize the cost of the product for the customers while maintaining features and quality, which leads to increase customer satisfaction. Simultaneously, EFPD may also encourage the organization to outsource some of the production processes to decrease production costs. Thus, EFPD may increase customer satisfaction due to the low cost and high quality, and improved features of the product. Based on the above arguments, in summary, we propose that NFPD and EFPD both have unique contributions toward creating a satisfied pool of customers and help organizations to attract and retain loyal customers. Accordingly, this study proposes that

H5: Novelty-focused product design is positively associated with designer performance.
H6: Efficiency-focused product design is positively associated with designer performance.

METHODS

Participants and Procedures

The data used in this study for empirical analysis was collected through longitudinal surveys in major cities of Pakistan. The sampling companies have full-time employees for product design, and research and development. We contacted the managing directors and HR managers of identified target companies. We explained to them the details of our research

TABLE 1 | Demographic information of respondents.

Measure	Items	Frequency	Percent	Measure	Items	Frequency	Percent
Gender	Male	158	53.6	Age range	18–25	138	46.8
	Female	137	46.4		26–35	102	34.6
Education Level	Intermediate	18	6.1		36–45	49	16.6
	Bachelor	142	48.1		46 or above	6	2.0
	Masters or above	135	45.8	Social media usage frequency	<10	39	13.2
Social media use experience	<5 years	11	3.7		11–20	103	34.9
	5–10 years	130	44.1		21–30	106	35.9
	Over 10 years	154	52.2		31 and above	47	15.9

TABLE 2 | Results of confirmatory factor analysis.

Variable	Cronbach's alpha	Composite reliability	Average Variance Extracted (AVE)
ESM	0.85	0.85	0.50
PSM	0.97	0.97	0.86
NFPD	0.80	0.81	0.59
EFPD	0.83	0.83	0.62
DP	0.84	0.84	0.56

ESM, Enterprise social media; PSM, Public social media; NFPD, Novelty-focused product design; EFPD, Efficiency-focused product design; DP, Designer performance.

and requested their voluntary participation in our survey. After the approval from the management of the 16 companies, we requested HR managers to help us distribute questionnaires to the employees.

In phase 1, questionnaires were distributed among employees engaged in designing the products. They were asked to report demographic information (i.e., age, gender, education, experience, experience with social media, social media usage frequency), enterprise social media use, public social media use, NFPD, and EFPD. After a month of the initial survey, direct managers of the respondents were requested to report the performance of the employees.

A total of 419 employees from 16 companies were invited to complete the surveys. A total of 124 employees did not respond or provided an incomplete response, leaving a total of 295 responses (70% response rate) used as the final sample to test our model. Additionally, in phase 2, 85 managers rated the performance of the respondents. All the participants completed the survey voluntarily. Among the respondents, 158 are male (53.6%), with most of the respondents' age was <35 years (81.4%); most of the respondents have at least a bachelor's degree (94%). **Table 1** shows the respondents' demographic characteristics.

Survey Items

This study followed previous research (Ali et al., 2019b; Khan et al., 2019; Bahadur and Ali, 2021) and used multi-item scales extracted from prior studies on social media and product development. We adopted the scale from Ou and Davison (2011) to measure enterprise social media using six items. This measure is extensively used in previous studies on social media (Cai et al., 2018; Pitafi et al., 2018; Wei et al., 2020). To measure the use of public social media, five items scale was adapted from van Zoonen et al. (2016). This measure is validated in other studies on social media (Van Zoonen et al., 2017). This measure assesses how people use public social media accounts for social and professional interactions, communication, and information sharing with coworkers and the public. Individual employees' public social media accounts, as well as company official pages on public social media (e.g., a company Facebook page), are used to facilitate social and work-related engagement and information exchange. Furthermore, this measure focused on Facebook, Twitter, and LinkedIn because these social media channels are predominantly used in Pakistan. A measure of 3 items to measure EFPD was adapted from Gerwin and Barrowman (2002). This is a validated measure by Naveh (2005). We adapted 3 items to measure NFPD from the study on Micheli and Gemser (2016). Each manager was asked to rate the performance of their subordinates on a 4 items scale adopted from Thompson (2005).

Previous studies have identified a number of factors that may also affect the results of our study. Therefore, in our analysis, we controlled the effect of age, gender, education, experience with social media, and social media usage frequency of each participant.

Common Method Bias

The data for empirical analysis was collected from multiple sources at two points in time. Yet, most of the variables were self-reported collected at a single point of time, which creates the possibility of the potential effect of common method bias (Podsakoff et al., 2003). First, we performed Harman's single factor test to check this potential effect of common method bias (Harman, 1976). Analysis results reveal that 17 constructs generated eigenvalues value >1.0, accounting for 71.27% of the variance. Further, results show that the first construct with an eigenvalue of 25.32% shows that it does not account for the majority of the variance. Next, we conducted two confirmatory factor analyses on employee-rated data to compare model fit results of the four factors model with a single-factor model. The findings of confirmatory factor analyses indicate that five factors model generate reasonable fit to the data ($\chi^2 = 192.04$, d.f. = 113, RMSEA = 0.05, CFI = 0.89, IFI = 0.98, NFI = 0.94, and GFI = 0.93) than single-factor model ($\chi^2 = 1397.86$, d.f. = 119, RMSEA = 0.19, CFI = 0.61, IFI = 0.61, NFI = 0.59, and GFI = 0.57). The results of confirmatory factor analyses further indicate that it is unlikely that common method bias will affect the findings of this study.

RESULTS

Analysis of Measurement Model

The validity of the scales was determined using confirmatory factor analysis (CFA). The CFA results suggested that the measurement model and dataset were well-fitted ($\chi^2 = 278.28$, d.f. = 179, RMSEA = 0.04, CFI = 0.97, IFI = 0.97, NFI = 0.93, and GFI = 0.92). The results suggest that all item loadings were above the recommended benchmark of 0.60 (Hair et al., 2020). We tested the convergent validity using Cronbach's alpha, composite reliability of constructs, and average variance extracted (AVE) (Fornell and Larcker, 1981; Flynn et al., 1990; Nunnally and Bernstein, 1994). **Table 2** reveals that the value range of 0.83–0.97 for Cronbach's alphas was reasonably above the suggested benchmark of 0.70. The results also indicate the range of 0.81–0.97 for composite reliability were acceptable as all values are above the suggested threshold value of ranged from 0.81 to 0.97 and were above the benchmark value of 0.70. Similarly, the threshold value of AVE is 0.50. The findings of the analysis indicate a range of 0.50–0.86 for AVE, which is above the acceptable value. Together, the results confirm the convergent validity of the model. To check the discriminant validity of the

TABLE 3 | Discriminant validity.

Variable	Mean	Std. Deviation	Gender	Age	Education	SM-UE	SM-UF	ESM	PSM	NFPD	EFPD	DP
Gender	1.46	0.50	NA									
Age	1.74	0.81	−0.09	NA								
Education	3.40	0.60	0.04	0.07	NA							
SM-UE	2.48	0.57	−0.09	0.00	0.00	NA						
SM-UF	2.55	0.91	0.01	0.00	−0.07	−0.01	NA					
ESM	3.64	0.67	−0.06	0.02	−0.02	0.14*	−0.02	**0.70**				
PSM	4.41	1.03	−0.06	−0.07	0.07	0.17**	0.01	0.18**	**0.93**			
NFPD	3.23	1.03	0.00	−0.04	0.01	0.18**	−0.07	0.17**	0.19**	**0.77**		
EFPD	3.81	0.70	−0.03	−0.05	0.02	0.01	0.06	0.27**	0.14*	0.12*	**0.79**	
EP	3.39	1.01	0.00	−0.04	−0.11	0.10	0.06	0.05	0.09	0.19**	0.21**	**0.75**

*SM-UE, Social media usage experience; SM-UF, Social media usage frequency; ESM, Enterprise social media; PSM, Public social media; NFPD, Novelty-focused product design; EFPD, Efficiency-focused product design; DP, Designer performance; *p < 0.05, **p < 0.01. The diagonal elements are the square roots of the AVEs are in bold.*

TABLE 4 | Factor loadings of the research constructs.

Variable	Items	Factor 1	2	3	4	5
ESM	ESM1	−0.033	**0.727**	0.055	0.025	−0.029
	ESM2	0.048	**0.723**	−0.003	−0.034	−0.004
	ESM3	0.023	**0.630**	0.001	0.050	−0.022
	ESM4	0.057	**0.670**	−0.010	−0.020	−0.016
	ESM5	−0.074	**0.696**	−0.046	0.006	−0.032
	ESM6	−0.001	**0.769**	−0.003	−0.007	0.086
PSM	PSM1	**0.878**	0.014	0.020	0.000	0.045
	PSM2	**0.958**	−0.008	−0.012	−0.002	−0.015
	PSM3	**0.968**	0.008	0.016	−0.023	−0.040
	PSM4	**0.919**	0.015	−0.028	0.024	0.017
	PSM5	**0.903**	−0.015	0.006	0.001	−0.016
NFPD	NFPD1	0.055	−0.026	−0.013	−0.011	**0.886**
	NFPD2	−0.028	−0.047	−0.057	0.040	**0.635**
	NFPD3	−0.040	0.059	0.046	−0.032	**0.774**
EFPD	EFPD1	0.063	−0.051	−0.001	**0.810**	0.027
	EFPD2	0.002	0.012	−0.011	**0.827**	−0.002
	EFPD3	−0.068	0.059	0.003	**0.720**	−0.024
DP	DP1	−0.017	0.002	**0.732**	−0.057	−0.014
	DP2	−0.003	0.033	**0.727**	−0.020	−0.053
	DP3	0.030	−0.039	**0.787**	0.013	−0.050

Extraction Method: Maximum Likelihood, a. Rotation converged in five iterations, ESM, Enterprise social media; PSM, Public social media; NFPD, Novelty-focused product design; EFPD, Efficiency-focused product design; DP, Designer performance. Bold values indicate the factor loading of each construct.

measurement model, we calculated the square roots of the AVEs. As presented in **Table 3**, results suggest that square roots of AVEs are greater than the correlations among variables. These results suggest that discriminant validity was achieved in our measurement model. Moreover, cross-loadings of the items are presented in **Table 4**. The results indicate that none of the items loaded on the other constructs at with unacceptably high. Thus, the lower cross-loadings of the items further suggest a good level of discriminant validity of the measurement model. The above results suggest that the measurement model satisfies the recommended levels of convergent validity, discriminant validity, and reliability.

Analysis of Structural Model

We used the structural equation model in AMOS 23.0 to test the structural model to analyze hypothesized relationships. Initially, fit indices indicate that our structural model reasonably fit with the data ($\chi^2 = 404.75$, d.f. = 292, RMSEA = 0.04, CFI = 0.97, IFI = 0.97, NFI = 0.90, and GFI = 0.91). The structural model analysis results are presented in **Table 5**. Specifically, the results indicate that enterprise social media usage is positively related to NFPD ($\beta = 0.34$, $p < 0.01$), and EFPD ($\beta = 0.36$, $p < 0.001$). These results show that H1 and H2 are supported by the empirical analysis. Results in **Table 5** further reveal that public social media usage is significantly related to NFPD ($\beta = 0.22$,

TABLE 5 | Results of the structural model.

Hypothesized relationships	Unstandardized coefficient	S.E.	C.R.	Conclusion
H1: ESM→NFPD	0.34**	0.13	2.60	Supported
H2: ESM→EFPD	0.36***	0.08	4.20	Supported
H3: PSM→NFPD	0.22**	0.07	3.03	Supported
H4: PSM→EFPD	0.07	0.04	1.57	Not -supported
H5: NFPD→DP	0.15**	0.05	2.98	Supported
H6: EFPD→DP	0.27***	0.08	3.37	Supported
Control variables:				
Gender→DP	0.02	0.10	0.19	
Age→DP	−0.01	0.06	−0.23	
Education→DP	−0.16*	0.08	−2.00	
SM-UE→DP	0.10	0.09	1.15	
SM-UF→DP	0.05	0.05	0.97	

*ESM, Enterprise social media; PSM, Public social media; NFPD, Novelty-focused product design; EFPD, Efficiency-focused product design; DP, Designer performance; SM-UE, Social media usage experience; SM-UF, Social media usage frequency; *p < 0.05, **p < 0.01, ***p < 0.001.*

$p < 0.01$), but not with EFPD ($\beta = 0.07$, $p > 0.05$). Thus, the results indicate that H3 was accepted, but H4 was rejected at this stage. **Table 5** shows that NFPD was positively correlated with designer performance ($\beta = 0.15$, $p < 0.01$: supporting H5). Results further indicate that EFPD has a significant positive effect on designer performance ($\beta = 0.27$, $p < 0.001$). Consequently, H6 was supported. Additionally, among the five control variables (age, gender, education, social media usage experience, social media usage frequency), education is found to have a significant negative effect on designer performance.

DISCUSSION AND CONTRIBUTIONS

Discussion

The purpose of this study was to investigate the relationship between social media use, product design, and designer performance. Based on OL theory and insights from information systems and product design literature, this study investigated the impact of enterprise social media and public social media by designers on product design and ultimately on designer performance. The empirical analysis of this study generated results, which are in line with previous studies and provide novel insights into the phenomena. Particularly, the findings empirically suggest that the role of NFPD and EFPD have interesting implications to explain the role of product design focus and designer performance. In addition, the results of the analyses show that NFPD and EFPD are significantly affected by the use of enterprise social media. Furthermore, results show that public social media use is more related to NFPD. These findings contribute to the existing literature on social media use and product design (D'Andrea et al., 2015).

The findings of the empirical analysis reveal that public social media use is not associated with EFPD. One possible reason for this insignificant relationship might be that in public social media, designers look for opinions and views about product design more than on the features and quality of the product. In this line, the literature on social media explains that the use of social media for interaction, communication, and knowledge exchange enables creativity and innovation of the employees (Ali et al., 2019a, 2020a). In other words, the use of public social media does not facilitate the requirements of EFPD development.

The results also disclose the impact of NFPD and EFPD on designer performance. Specifically, results indicate that EFPD is strongly related to designer performance. Besides, results also support the NFPD has a significant impact on customer satisfaction. The results indicate the both NFPD and EFPD are important factors in describing customer satisfaction.

Theoretical Contributions

Our research has important contributions to the theory. First, this study contributes to social media literature by theoretically developing a model and empirically testing the direct relationship between social media use and product design. Though, research has revealed the implications of social media for communication, knowledge sharing, learning, creativity, and innovation (Davison et al., 2018; Gong et al., 2019; Ali et al., 2020b; Laitinen and Sivunen, 2020). However, not theoretically nor empirically, it is clear whether social media is also effective for product design. This current research extends the literature on social media by explaining the impact of social media on product design.

Second, this study extends the literature on social media and product design by exploring how different social media platforms impact product design focuses. Specifically, this study investigates how enterprise social media and public social media are linked with NFPD and EFPD development. Thus, this investigation highlights the importance of using enterprise social media and public social media to facilitate product designing. This study, in line with Meuser et al. (2016), thus, indicates that integrated use of both enterprise social media and public social media has numerous benefits for the organizations. The results interestingly highlight that public social media use does not significantly affect EFPD. However, both kinds of social media platforms have a significant impact on NFPD and EFPD.

Third, based on OL theory (Real et al., 2006), this study contributes to the existing social media and product design literature by highlighting the importance of using different social media tools to design products that can satisfy the novelty and efficiency requirements of the customers, hence leading to designer performance. Thus, we expand the literature on organizational learning and social processes of innovation by engaging different stakeholders in the product design process using social media platforms. This study indicates that a full understanding of the complex and joint nature of social media platforms, design focus may bring novel insights for the organizations to attract and retain satisfied customers and improved designer performance.

Managerial Implications

Our research has important implications for managers. First, designers must pay attention to their product design. NFPD and EFPD can create value for both organization and the customers. Therefore, managers who need to improve organizational performance need to think about whether the novelty of a product design or efficiency of a product design will create value for them. Second, managers should also be aware of the important role social media plays in enabling designers to get insight, ideas, and information from different sources such as co-workers and potential users. Specifically, the empirical findings call for a strategic integration between enterprise social media use and public social media use. Designers who are facilitated to simultaneously use enterprise social media and public social media can create novel and efficient designs according to the organizational structural capabilities settings while satisfying customer requirements. It can potentially include the media rich environments i.e., virtual or augmented reality to communicate in effective manner. Thus, we propose that managers should adjust the balance of using enterprise social media and public social media usage by the employees to achieve the required NFPD and EFPD.

Limitations and Future Directions

Despite the contributions to the theory and practice, we note this study has the following limitations, which indicate research directions for future scholars. The survey for this study was conducted in Pakistan. Pakistan is a developing country and has its own political, economic, and cultural dimensions. Although, such differences are unavoidable in research, however, these may limit the generalizability of our findings. Thus, we encourage future studies to test our model in their own socio-cultural context of their country. Second, in this study, we measured designer performance using subjective measures rather than using an objective measures. Future scholars are thus suggested to use objective measures such as product sales. Third, our model investigates enterprise social media use and public social media use as two types of social media used by the employees. Yet, employees use enterprise social media and public social media for work-related purposes and also for social-related purposes. Research has demonstrated that different usage purposes have unique implications for the performance of the employee (Ali-Hassan et al., 2015; Ali et al., 2019a; Cao and Yu, 2019). Thus, we recommend future studies to investigate the impact of work-related social media use and social-related social media use on the NFPD and EFPD.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

NH contributed to conception of this study. MH performed the statistical analysis. MG, FA, and NH wrote sections of the manuscript. All authors contributed to manuscript revising, read, and approved the submitted version.

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Engaging Users on a Q&A Social Media Platform: The Influence of Disease Attributes and Message Features on Public Discussions of Depression

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INTRODUCTION

Depression has affected over 54 million people in China and 322 million people around the world, which made it a great public health concern (WHO, 2017). Meanwhile, the public increasingly uses social media to discuss depression-related topics (Guntuku et al., 2017). In recent times, most studies regarding the engagement of users in depression-related discussions on social media had targeted popular platforms, such as Facebook, Twitter, Instagram, YouTube, or Sina Weibo (Cavazos-Rehg et al., 2016; Reece and Danforth, 2017; Pan et al., 2018). Research already indicated that people tend to show different behavioral patterns on different social media platforms (Alhabash and Ma, 2017; Waterloo et al., 2018). However, little research has been done to investigate how depression topics are discussed in a question-and-answer (Q&A) social media platform, where in-depth discussions of knowledge are encouraged.

To study this topic, we collected data from a popular Chinese Q&A platform Zhihu (in Chinese 知乎). Compared with other types of social media, Zhihu offers more than the conventional ways for users to engage in conversations in the Q&A threads. On Zhihu, once a question is proposed, other users can *view*, *follow*, or *answer* a question. This is defined as the Question-level (Q-level) of user engagement in this study. For each answer underneath each question, other users can *agree* or provide additional *comments*. This is defined as Answer-level (A-level) user engagement.

Scholars have attempted to identify the different meanings of such user engagement on social media. Based on two theoretical models, e.g., the heuristic-systematic model and the elaboration likelihood model, the action of "like" or "favorite" represents the peripheral route (heuristic) engagement which mostly involves emotional responses to the messages, whereas the action of "commenting" represents the central route (systematic) processing that involves more in-depth cognitive deliberation of messages (Liu et al., 2017). Following the previous literature, *answering* represents deeper cognitive engagement compared to *viewing* or *following* at the Q-level. While at the A-level, *agreeing* somehow is similar to the actions of *like* or *favorite*, while *commenting* indicates a deeper elaboration of the information.

In this study, we are specifically interested in how disease attributes and persuasive features of depression-related discussions on Zhihu are associated with these different levels of user engagement in both Q&A levels. We applied two sets of frameworks to identify the features of depression-related messages namely, The Common Sense Model of Illness Self-Regulation (CSM), to identify the disease attributes of depression being discussed on Zhihu, and the persuasion-related theories to identify the message characteristics that are persuasive or engaging.

The Common Sense Model describes how people make sense of certain illnesses or health threats and how representations of an illness from common sense would guide their coping strategies and efforts (Leventhal et al., 2003). The Common Sense Model (CSM) identifies five core attributes of illness that people commonly used to construct the representations of an illness, including *identity*, *cause*, *timeline*, *consequences*, and *controllability* (Please see **Appendix A** for detailed definitions of these categories). Research has shown that the different beliefs of people regarding illness representations can influence their emotional and behavioral responses. For example, perceptions of the timeline and consequences of diabetes were shown to affect the emotional distress of people, and control beliefs were found to be linked with treatment adherence (Paddison et al., 2010; Awasthi and Mishra, 2011). Rather than from the individual perspective, this research aimed to expand the CSM literature by analyzing Zhihu messages from the CSM framework and exploring how engaging are the messages that cover different disease attributes of depression on Zhihu.

The line of persuasion research also identified some message features that may elicit different responses to the messages (Dillard and Pfau, 2002). The message features considered in this study are the typical persuasive elements being identified, including narratives, affect, social support, imagery, source anonymity, and the crowdsourcing status (Please see **Appendix A** for a detailed definition of these concepts). First, previous research generally indicated that narratives are more engaging by immersing people into the stories (Clementson, 2020); Secondly, in terms of affect, the findings seem to indicate that negative messages are more sensational on social media (Jenders et al., 2013); Thirdly, a study found that supportive messages could create the in-group dynamics among social media users, which can trigger more commenting (Rus and Cameron, 2016); Fourthly, *imagery* messages are often processed faster and evoked emotional reactions on social media, such as "like" or "favorite" (Magnan and Cameron, 2015); Fifth, the anonymity of users can sometimes lead to higher engagement on social media when discussing sensitive topics (Suler, 2004), but anonymity was also found to be harmful in some online interactions for the lack of social cues (Laffey et al., 2006); Lastly, Zhihu enables certain level of crowdsourcing by encouraging other users to edit listed questions in order to come up with better and clearer ones. We would make the first-step exploration about the relationship between the crowdsourcing status and user engagement. In general, the present study plans to make unique theoretical contributions to the literature of persuasion by examining how Q&As with persuasive characteristics would have their specific ways of engaging users on Zhihu.

METHODS

Sampling

After the Institutional Review Board (IRB) approval from a northern Chinese university, we used web-scraped data from the Zhihu for this study. A similar procedure has been used in the study of Pan et al. (2017). In specific, we first wrote the web crawler in computer programming language Python (Python Software Foundation in Delaware) to extract all questions with the keyword depression (in Chinese 抑郁症) during the time parameter ranged from November 1, 2017 to January 31, 2018. This time frame was chosen because Zhihu only allowed the program to extract the most recent 3-month when the study was conducted. We finally obtained a sample of 119 questions in total. At the Q-level, the following data were crawled from Zhihu: the ID information of senders if applicable, the posting date and time, the text of questions, the number of times each question is being edited, and the number of views, follows, and answers of all 119 questions.

In the second step, we identified the 20 most popular questions based on the ranking system of Zhihu out of the 119 questions. We wrote another web crawler in Python to extract all the answers to these 20 questions. Besides the text of the answers, the following data of answers were also collected: the posting date and time, the URL of images if applicable, and the number of agreements and comments of answers. There were altogether 29,157 answers provided to the 20 questions. We did a random selection of 40 answers from each of the 20 questions and constructed a sample of 800 answers.

The units of analysis for this study were per question and per answer. The coding schemes of the Q-level entries and A-level entries were detailed below.

Coding Scheme

The Q-Level Coding

Message features considered at the Q-level include five disease attributes defined in CSM, whether applying narrative, source anonymity, and crowdsourcing status.

More specifically, the disease attributes defined in CSM were coded as: *identity* = 1, *cause* = 2, *timeline* = 3, *consequence* = 4, *controllability* = 5, and *others* = 6. *Narrative* was coded into two categories which were narrative = 1 and non-narrative = 0. *Anonymity* was coded into two categories which were anonymous = 1 and non-anonymous = 0. *Crowdsourcing* was coded based on the editing functions that Zhihu provides. Zhihu welcomes users to edit the questions to make them clearer to the audience. There were three areas in a question entry that can be edited which were (1) the question tags, (2) the question itself, and (3) the explanation of the question. The index of crowdsourcing was coded by adding up the numbers of the editing times in these three parts.

The A-Level Coding

At the A-level, we included the following message features: the CSM disease attributes defined in CSM, whether applying narrative, whether indicating social support, imagery, and the message affect.

Different from questions, answers are lengthier. Each answer normally covers the information of more than one category defined in CSM. Therefore, during A-level coding, we treated each category of CSM as a dichotomous variable, with the presence of each category, i.e., identity, cause, timeline, consequence, and controllability, coded as 1 and the non-presence coded as 0. In addition, *Narrative* was coded into two categories which were narrative = 1 and non-narrative = 0.

TABLE 1 | Descriptive statistics for the message features of Zhihu questions and answers.

	Questions (N = 119)				Answers (N = 800)			
	Frequency	**Percentage**	***M***	***SD***	**Frequency**	**Percentage**	***M***	***SD***
CSM								
Identity	24	20.17			294	36.75		
Cause	12	10.08			107	13.38		
Timeline	2	1.68			176	22		
Consequence	27	22.69			179	22.38		
Controllability	26	21.85			238	29.75		
Others	28	23.53						
Narrative	30	25.21			581	72.63		
Anonymity	41	34.45						
Crowdsourcing								
Tags			4.18	3.5				
Question			1.39	0.91				
Explanation			1.37	3.13				
Affect								
Positive					94	11.75		
Negative					118	14.75		
Neutral					588	73.5		
Social support					113	14.13		
Imagery					116	14.5		
Q-Number of followers		2,792.84	6,418.01					
Q-Number of views		803,872.14	2,127,582.9					
Q-Number of answers		367.13	853.1					
A-Number of agreements						227.78	947.71	
A-Number of comments						60.38	183.22	

CSM, Common Sense Model of Illness Self-Regulation.

Affect was coded into three categories which were positive = 1, negative = 2, and neutral = 0. *Social support* was coded into two categories which were yes = 1 and no = 0. *Imagery* was coded into two categories which were yes = 1 and no = 0.

The detailed definition of these categories is shown in **Appendix A**.

Dependent Variables

User engagement for the Q-Level was measured by the *numbers of views*, *followers*, and *answers* to each question. User engagement for A-Level was measured by the *number of agreements and comments* to each answer.

Coding Procedure

To establish inter-coder reliability, two graduate students whose first language is Chinese coded all 119 questions and 20% of 800 answers. The coders first went through the training session and discussed the meaning of each category. After the training session, two coders first rated all questions based on the coding scheme, and the disagreement was resolved by discussion. For the coding of 800 questions, both coders first rated 160 questions from 4 questions to test the reliability of the coding scheme and reached an agreement through discussion. The inter-coder reliability (Cohen's Kappa) ranges from 0.84 to 0.97 for all coded variables. After that, they independently coded half of the test sample.

DATA ANALYSES

The data analyses were conducted with STATA version 15 (developed by Stata Corp LLC in Taxes). We first performed data cleaning and preliminary analysis, yielding descriptive statistics and inter-rater reliability of each variable. A set of negative binomial regression analyses was conducted to examine how the proposed factors were associated with user engagement. This type of analysis was chosen because all dependent variables examined at the Q&A level were not normally distributed. In addition, considering the nested nature of answers, multi-level negative binomial regressions were conducted to examine the relationships between message features and user engagement at the A-level. Questions were treated as clusters to account for the non-independence of answers nested within the 20 questions. The significance level was set at $p < 0.05$.

Descriptive Analyses

We first conducted the descriptive analyses of message features and user engagement of depression-related discussions on Zhihu. The detailed results are presented in **Table 1**.

TABLE 2 | Negative binomial regression on user engagement in questions and answers as functions of message features.

Independent Variables	**Questions (*N* = 119)**						**Answers (*N* = 800)**			
	Views		**Follows**		**Answers**		**Agreements**		**Comments**	
	B	**IRR[a]**	**B**	**IRR**	**B**	**IRR**	**B**	**IRR[a]**	**B**	**IRR**
CSM										
Identity	0.52	1.67	0.58	1.79	0.23	1.26	0.69***	2.00	0.55***	1.72
Cause	0.16	1.18	−0.01	0.99	0.05	1.05	0.28	1.33	0.35	1.42
Timeline	2.76*	15.81	1.20	3.32	1.80	6.06	−0.36*	0.69	0.06	1.07
Consequence	−0.19	0.83	−0.18	0.83	0.00	1.00	0.68***	2.00	0.57***	1.76
Controllability	−0.16	0.85	−0.48	0.62	−0.36	0.70	0.11	2.00	0.15	1.16
Others	x	x	x	x	x	x				
Narrative (Yes)	−2.35***	0.10	−2.46***	0.09	−1.61***	0.20	−0.35*	0.70	−0.07	0.93
Anonymity (Yes)	0.13	1.14	0.40	1.49	−0.07	0.93				
Crowdsourcing	1.66***	5.23	1.79***	6.00	1.45***	4.28				
Affect										
Positive							0.91***	2.48	0.88***	2.41
Negative							0.30	1.35	0.56**	1.76
Neutral							x	x	x	x
Social support (Yes)							0.42*	1.51	0.05	1.06
Imagery (Yes)							0.24	1.27	0.47*	1.06
Constant	4.06***	0.27	58	2.53***	0.25	12.59	4.06***	58	2.53***	12.59

**p <0.05, **p <0.01, and ***p <0.001.*
[a] The Incidence Rate Ratio (IRR), a measure of effect size, is calculated by exponentiating the regression coefficient.
CSM, Common Sense Model of Illness Self Regulation.

At the Q-level, about 76.5% of the questions asking about illness attributes of depression mentioned by CSM, with consequence-related questions appeared 22.7% of the time, followed controllability (21.9%), identity (20.2%), cause (10.1%), and timeline (1.7%). The percentage of questions not belonging to CSM categories was about 23.5%. Meanwhile, most questions were not narrative questions, but rather asking basic facts and understanding of depression (74.8%). Finally, most questions were asked in a non-anonymous manner (65.6%).

At the A-level, identity appeared 36.8% of the time, followed by controllability (29.8%), consequence (22.4%), timeline (22.0%), and cause (13.4%). In terms of persuasive features, most answers used the narrative style (72.6%), showed no obvious affect (73.5%), and contained no supportive messages (85.9%) and no imagery (85.50%).

Regression Analyses

In this study, we also conducted a set of negative binomial regressions to explore how disease attributes and message features were associated with user engagement in both Q&A levels (see **Table 2**).

CSM Disease Attributes and User Engagement

At the Q-level, generally, we found no significant difference in user engagement in five disease attributes of depression (identity, cause, timeline, consequence, and controllability). We only found that the timeline-related questions were more likely to increase views compared to questions not related to CSM disease attributes. At the A-level, the topics relating to depression identity or consequence significantly increased user engagement by receiving more agreements and comments.

Persuasive Message Features and User Engagement

At the Q-level, we examined whether the persuasive features *narrative*, *anonymity*, and *crowdsourcing* would affect user engagement in depression-related questions on Zhihu. The analyses indicated that narratively phrased questions were less likely to be viewed and followed by users. We also found that if a question was edited more times by users, it would be more likely to be viewed, followed, and answered.

At the A-level, we examined how *narrative*, *affect*, *social support*, and *imagery* presented in answers had affected user engagement. The analyses indicated that narratively phrased answers were less likely to be agreed upon. When the positive effect was mainly shown in answers, they were more likely to receive agreements and comments than the ones with neutral or negative affect. Answers with social support information were more likely to be agreed upon, and the answers with images were more likely to be commented on.

CONCLUSION AND IMPLICATIONS

Guided by the CSM and persuasion research framework, the data collected on a Q&A social media platform provided several interesting empirical findings regarding the relationships between message features and user engagement.

Our first theoretical contribution was to expand the application of CSM to online data by examining how users of a Q&A platform are engaged in the discussions of the attributes of the disease of depression which was identified by the CSM framework. For instance, this study found that discussions of depression identity or consequences can trigger more engagement among Zhihu users.

The second theoretical contribution was that we enriched the literature of persuasion by examining how some persuasive features in Q&A messages can engage users in different ways. We identified some surprisingly interesting patterns.

First, although previous research generally indicated that narratively phrased messages can be more engaging, our research showed the opposite. Users were more involved in the discussions of threads not related to personal experiences and feelings on Zhihu. As Zhihu continues to brand itself as a platform for knowledge sharing of objective or scientific information, the engagement of users might be influenced by such well-claimed behavioral norms on Zhihu, which leads them to be more involved in messages that tend to be factual or non-personal.

The study also revealed that messages with positive affect were mostly engaging by receiving more agreements and comments compared to messages with neutral or negative affect. It indicated that positive messages could arouse both emotional and cognitive responses among users. This finding is consistent with previous studies showing that people tend to use positivity to stay optimistic about a disease that seems very desperate for many people (Cameron and Jago, 2008), and the positive affect shown in depression-related messages was more engaging.

Our study also found that answers including supportive messages usually offered treatment suggestions or doctor recommendations to the seekers. Some also offered encouragement and emotional comfort. The presence of supportive messages received significantly more agreements but not more comments. Because Zhihu is not viewed as a dominantly support-exchange platform, supportive messages could hardly lead to more in-depth involvement such as giving comments.

Crowdsourcing, i.e., times of the questions being edited, also positively predicted user engagement. The more times a question being edited, the more likely that question is viewed, followed, or answered. Our study suggested that the function of crowdsourcing provided by a Q&A social media platform helps engage users. By viewing the editing process, users can possibly sense the importance of a question and pay more attention to it, which may motivate more engagement.

Finally, as Zhihu becomes the important channel for the Chinese public to discuss depression-related health topics, our data could also provide valuable knowledge by revealing the specific patterns of user engagement of this topic on Zhihu. Future depression-related interventions applied on Zhihu could apply such knowledge and prepare messages to engage users on this platform.

The current dataset has several limitations. First, we collected a sample from November of 2017 to January of 2018, the most recent sample that was available to us. Our data did not allow us to study a longitudinal change and limited the capability to compare the presence of different message features over time. Second, our data focused on one popular Q&A social media platform (Zhihu) in China. Similar platforms can also be explored such as Quora in the United States. Cross-country comparison is meaningful to understand how users from different countries discussed a particular health issue. Third, research has shown that people tend to react differently when facing different health conditions and behaviors (Shen et al., 2015). Therefore, the current data might only be applied to the discussions of depression. Despite all these, it is noteworthy to test whether such findings are also effective in explaining other health conditions.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Runze Wang, Institutional Review Board, School of Journalism and Communication, Renmin University of China. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

SP was responsible for deciding the coding framework, data collection, analyses, and writing results. NY was responsible for conceptualization, writing introduction, methods and conclusion. YH was responsible for data cleaning and coding. DZ was responsible for conceptualization, editing, and finalizing the paper. All authors contributed to the article and approved the submitted version.

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APPENDIX

Appendix A | Coding framework for message features of Zhihu QandA on depression.

Category	Definition
CSM	
Identity	Messages mentioning the illness label and associated symptoms
Cause	Messages mentioning the perceived cause of the condition
Timeline	Messages mentioning the predictive belief about how long the condition might last
Consequences	Messages mentioning how they have been affected by the condition physically, socially, psychologically, and other potential ways
Controllability	Messages mentioning the treatment options and one's ability to influence illness progression
Others	Messages not covering the above five elements of CSM
Narrative	
Narrative	Messages mainly stating personal experiences and feelings, normally in the form of storytelling
Non-narrative	Messages not related to personal experiences and feelings, but rather stating facts or opinions from the non-personal perspective
Affect	
Positive	Messages mainly indicating hope, optimism, and positive attitudes while fighting depression
Negative	Messages mainly expressing sadness, fear, anxiety, hopelessness, and other negative emotions
Neutral	Messages that take relatively neutral tones
Imagery	Messages including photos, graphics, animations, and other visual forms
Social support	Messages giving advices and help or showing empathy and comfort to another user, rather than just discussing public knowledge on depression

CSM, Common Sense Model of Illness Self-Regulation.

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Investigating the Impact of Fear Related to COVID-19 Disease on Situational Humor *via* Social Networking Sites

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The current study investigates the impact of fear related to coronavirus 2019 (COVID-19) disease on situational humor, and also on social networking sites (SNS) usage as a mediator. Furthermore, this study investigates the impact of fear-related COVID-19 disease on situation humor *via* SNS usage, focusing on the gender perspective of university students. This study also examined the impact of fear related to COVID-19 disease on situational humor in students from various degree programs, such as BS and MS. For this cross-sectional study, data were collected from 24 different Pakistani universities using purposive sampling between December 2020 and May 2021. This study used social media platforms like WhatsApp, Facebook, LinkedIn, and Twitter (and also email) to collect data online. According to the findings of this study, fear related to COVID-19 disease was found to be significantly negatively related to situational humor and SNS usage, whereas SNS usage was positively related to situational humor. The findings also revealed that SNS usage is a key mediator in the relationship between fear related to COVID-19 disease and situational humor. In addition, male university students used more SNS and had a higher situational humor response than female university students, and female university students reported a higher fear related to COVID-19 disease. This study provided useful findings of the impact of fear related to COVID-19 disease on situational humor among students in various academic programs, such as bachelor's program and master's program.

Keywords: social networking sites, situational humor, fear of COVID-19, university students, education

INTRODUCTION

The coronavirus 2019 (COVID-19) pandemic is a serious threat to the worldwide society, affecting every aspect of life and continuing to pose a challenge to global nations. Since COVID-19 became a pandemic, the focus of the world has properly been on protecting the public, preventing virus transmission, and treating victims of COVID-19 (Kumar et al., 2021). During this time, governments all over the world have enacted rules to minimize human contact, such as quarantine (Lin et al., 2020), physical separation, and social isolation. Following the first confirmed case on February 26, 2020, in Pakistan, the government has implemented several measures, namely, mandatory online learning in all schools, mandatory quarantine for people under the age of 18 and over the age of 65, 15-day quarantine in state accommodation units for people traveling from abroad, mandatory face mask use outside, and a mandatory vaccination program (Khattak et al., 2020). Although these efforts are necessary to stop the spread of COVID-19, they must be weighed against the possibility of detrimental mental health outcomes. Individuals who have been quarantined may develop boredom, hostility, and fear related to COVID-19 (Zheng et al., 2020). As a result of the symptoms of the viral infection mixed with the unfavorable effects of treatment, cognitive distress and anxiety of people may intensify (Khan et al., 2021).

The COVID-19 pandemic has evolved into the most serious public health issue of the world, posing a major threat to people everywhere. Apart from the immediate danger of the virus, the current scenario has caused a great deal of stress, and also enormous anxieties and concerns about the virus, which has had significant social and economic effects on the health and activities of people (Khan, 2021). COVID-19-related anxieties and social alienation could be a source of stress and disease fear (Ahorsu et al., 2020). Furthermore, fear related to COVID-19 causes people to remain on high alert to protect themselves and their loved ones, which can lead to social isolation, fear, and panic (Yip and Chau, 2020). Furthermore, digital and social media are among the sources that are propagating panic about the COVID-19 pandemic by disseminating sensational and false news and stories, which has raised stress and anxiety in people (Zheng et al., 2020). During the ongoing COVID-19 outbreak, on the other hand, the usage of social networking sites (SNS) platforms has provided a welcome escape from health disasters and global disasters (Cao et al., 2018). According to the U.S. Census Bureau, more than 42% of persons who used SNS in December 2020 showed signs of depression and anxiety, up 11% from the previous year (Olelewe, 2020).

The education sector is the most affected worldwide by the COVID-19 epidemic, which causes students to stay at home owing to school, college, and university closures. They mostly rely on online classes to continue their academic pursuits, and social media is their primary means of bridging the communication and interaction gaps that exist between face-to-face students at schools and universities (Petzold et al., 2020). The COVID-19 pandemic has had a variety of effects on students. For example, fear and anxiety are generated by staying at home and implementing protective measures such as social isolation, on the one hand (Durante et al., 2021). Students, on the other hand, were stressed out due to the uncertain nature of their studies and exams (Zheng et al., 2020). This situation left the students in a panic, and it strengthened their reliance on SNS and digital media for communication and instructional activities (Lin et al., 2020). In previous studies, in the COVID-19 situation, the usage of SNS is rarely investigated in the context of the mental health of students (Steinfield et al., 2008). Fear related to COVID-19 is linked to intolerance of instability (Cao et al., 2019), health suffering, the risk to loved ones, and expanded information channels (e.g., traditional media, SNS usage, and professional media) (Lin et al., 2020). People are also concerned about the effects of COVID-19 on the healthcare system, the economy, culture, job loss, and changes in daily routines, all of which may add to the problem (Durante et al., 2021).

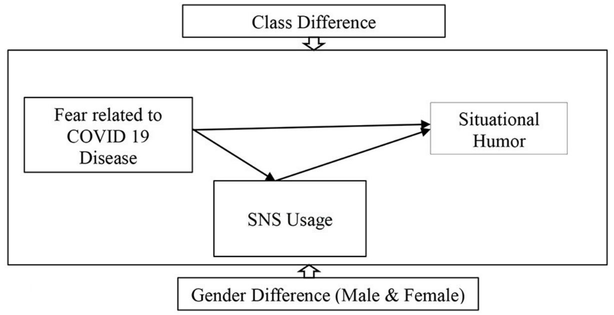

FIGURE 1 | Research model.

The purpose of this study is to see how fear related to COVID-19 affects the situational humor of students and their usage of SNS. Furthermore, this study looks at the role of SNS usage as a mediator in the indirect association between fear of the COVID-19 pandemic and student situational humor. In particular, this research looks into the impact of gender (male vs. female) and educational disparities on the predicted link in our research model. We anticipate that this research will contribute to a better understanding of the link between the dependent variable (fear related to COVID-19) and the independent variable (situational humor). On the other hand, this research will help us gain a better grasp of how gender differences affect these relationships. Similarly, understanding the effects of education differences on our suggested research model will be helpful (see **Figure 1**).

HYPOTHESIS DEVELOPMENT

According to a large-scale study, the general populace of Iran has a very high dread about COVID-19 (Ahorsu et al., 2020). Fear, according to previous experience, can have a negative impact on the health of an individual (Lin et al., 2020), and also negatively impact individual happiness. Governments require data on COVID-19 fear among the general public to establish effective COVID-19 transmission control policies that do not increase psychological distress (Wang, 2021). Many public institutions, including education, are currently focusing their efforts and resources on controlling COVID-19 infection, and have implemented national policies to reduce the spread of the virus (Liang et al., 2020), such as social distancing measures, stay-at-home policies, online classes, and the closure of public educational institutions (Rapanta et al., 2020). Although these educational policies and practices may effectively control the growth of COVID-19, their implementation will likely increase fear among children and parents, causing psychological and educational difficulties (Khattak et al., 2020). The human nature of SNS usage is violated by such protracted stays indoors and without face-to-face contact with family and friends (Xue et al., 2020), which has disrupted the daily-living routines of persons, and heightened fear of infection and psychological stress.

Students are in a similar scenario when propagating the fear of the COVID-19 pandemic (Cao et al., 2019). Similarly, students may experience a negative impact on their sense of humor as a result of spreading the fear of the COVID-19 outbreak. Thus, the following hypothesis is proposed in this study.

H1: Fear related to the COVID-19 pandemic among students has a negative impact on student situational humor.

Individuals who are compelled to stay at home for an extended period have little choice but to change their focus from social to indoor activities and may wind up relying more on SNS and the Internet for updated information, amusement, and virtual gossip with friends (Zheng et al., 2020). One reason for the rising use of the Internet and SNS usage is that people want to learn more about COVID-19. Indeed, after the emergence of COVID-19, more than 80% of the 1,304 participants in a recent Chinese study reported remaining at home 20–24 h a day due to school and company closures (Wang et al., 2020). According to the same study, more than 90% of participants learned about COVID-19 on the Internet and were eager to learn more about it, namely, the COVID-19 transmission route, medication and vaccine availability and effectiveness, travel advice, overseas COVID-19 control experiences, the number of confirmed cases with locations, and COVID-19 prevention advice. Liu et al. (2021) found that COVID-19 information overload *via* SNS usage seemed to have a detrimental effect on the mental well-being of general SNS usage. According to mental health literature, COVID-19 affects college students on many levels, such as fear of contracting a disease or being able to infect others in their SNS usage, anxiety about transformations in course content delivery, and uncertain classroom parameters (Tasso et al., 2021). Nabity-Grover et al. (2020) argue that global health catastrophes, like the COVID-19 epidemic, change how and what people share on SNS. The fear related to COVID-19 may have an impact on those who work in the field of SNS and the Internet. Fear of a COVID-19 pandemic is likely to have a negative impact on SNS usage. The following hypothesis is proposed in this study.

H2: Fear related to the COVID-19 pandemic among students has a negative impact on the usage of SNS.

The tendency of experiences to make others laugh and amuse them is known as humor. Humor was found to engage and sustain the interest and attention of students when used by human educators (Zillmann et al., 1989). Unfortunately, disease information obtained from the SNS is not always reliable. Participants in a recent study analyzing general public awareness and attitudes of COVID-19 in the United States and the United Kingdom believed several misconceptions and falsehoods that had proliferated on SNS usage (Geldsetzer, 2020). Although many mental health professionals and public health experts have stated that psychological distress among different populations should be considered during the COVID-19 outbreak (Lin et al., 2020) to the best of the knowledge of the present authors, only three studies have collected empirical data on this topic (Ahorsu et al., 2020). The significance of SNS usage and the Internet in linking psychological processes and their impact on individual personality traits has been highlighted in several previous research (Khan and Khan, 2019; Wang et al., 2020). According to the WHO, students are currently fighting not only a global pandemic (COVID-19) but also an SNS epidemic, with some media outlets claiming that the coronavirus is the first true SNS antidepressant because it has infected the entire globe. People are panicking and fearful because of the rapid flow of information and misinformation (Hao and Basu, 2020). According to Sarner (2020), hearing a lot of information and news about COVID-19 has influenced the public and spread fear. According to Naeem (2021), fear related to COVID-19 spreads more quickly among SNS users than among those who use less SNS. People rely on SNS for COVID-19 information and facts because some countries use filters, which is why SNS provides fear related to COVID-19 but all the facts. After all, SNS users use the platform to express their feelings, emotions, and thoughts, which can be a valuable source of data for mental health research (Cellan-Jones, 2020). In this regard, the Internet and SNS usage could play a role in the relationship between COVID-19 fear and situational humor. To predict the mediating role of SNS usage, this study suggests the following hypothesis.

H3: The relationship between fear related to COVID-19 disease and situational humor is mediated by SNS usage.

Fear is one of the most common psychological repercussions of COVID-19, as seen above. In extraordinary circumstances, such as illness outbreaks and epidemics, people appear to be terrified (Pakpour and Griffiths, 2020). COVID-19 fears are likely to be fueled by the first appearance and the uncertainty of disease surrounding its future (Asmundson and Taylor, 2020). Several previous studies have looked at how fear affects humor and happiness in students and employees, but few have looked at how fear of the COVID-19 pandemic affects situational humor among university students by gender. To assess the effect of gender differences on the relationship proposed in our research model, this study offered the following hypothesis.

H4: Fear related to COVID-19 disease has a higher impact on SNS usage and situational humor of female students rather than male students.

Furthermore, the previous study found that over usage of SNS the link between scarcity messages and perceived excitement, whereas the desire to buy moderates the relationship between perceived excitement and behavior impulsively (Islam et al., 2021). Moreover, the global COVID-19 catastrophe has wreaked havoc on the global economy and medical care, leaving many thousands of people (including students) in a state of fear, panic, and uncertainty (Islam et al., 2021). In the previous research, it was found that brand communication had a significant impact on the relationship between consumer engagement and brand attachment on SNS usage (Arya et al., 2018). This study proposed the following hypothesis to evaluate the impact of the above variables in the setting of educational groups in the current research.

H5: Fear related to COVID-19 disease has a higher impact on SNS usage and situational humor of students of BS program rather than students of MS program.

METHOD

Data Collection Procedures

A pilot study with a small sample size was conducted before the full-scale study. The purpose of the pilot study was to ensure that the variables and construct items proposed in our research model were both reliable and valid. A total of 50 students were contacted *via* social media platforms at their convenience, but only 30 of them responded completely. The majority of respondents (64%) were male, and the majority of students (79%) were undergraduates.

This full-scale study was quantitative and cross-sectional. The survey of this study took place between December 2020 and May 2021, with a sample of students from Pakistani universities. A Google Forms-based online survey questionnaire was created to collect responses. The COVID-19 situation in Pakistan continued to deteriorate during this period, with 139–160 cases recorded each day, gradually escalating to several hundred cases per day (Abid et al., 2020). This study approached the students of 24 universities (BS students, $f = 417$, % = 34.8; MSc students, $f = 553$, % = 46.1, MS students, $f = 136$, % = 11.3; and PhD students, $f = 94$, % = 7.8). Prospective participants were given an explanation sheet that includes details regarding the study (such as the title, the purpose and significance of the study, privacy information, and the email addresses and phone numbers of researchers). The community circulated the informational document to other students in person and by email, text message, and SNS usage. Students who agreed to participate were approached by email or text message by a member of the study team. The researchers answered any queries these potential participants had concerning the study. Each student who accepted to participate received a survey that directed him to the consent form, and their agreement was confirmed with an electronic signature (i.e., the ticking of a box on the form). After getting consent, participants were texted or emailed a link to the Google Forms questionnaire. The online questionnaires were distributed to 1,500 university students, and 1,200 (90%) responded. The following criteria were used to decide who was eligible to participate: (1) enrolling at a university and (2) a Pakistani citizen. Students who were enrolled in colleges or institutions were not allowed to participate. Purposive sampling was used in this study because it focuses on certain characteristics of a population that are of interest. In this context, university students whose academic activities were hampered were sampled, and they were using SNS to get updates and the latest news about the COVID-19 pandemic situation, and educational instruction from universities and educational authorities. The online questionnaire was created using Google Forms. Google Forms is an online application that allows you to collect feedback from users quickly and efficiently. The survey results were automatically gathered in an Excel spreadsheet and then imported into SPSS for analysis.

Measurement Scale

This study used a measurement scale that had been used in previous studies. Three authentic and reliable instruments were used in this study to collect participant responses: the Fear Related to COVID-19 Scale, the Situational Humor Response Questionnaire, and the Social Networking Sites Usage and Needs Scale. These three scales were used in both the pilot and the main study. These scales have been used for a pilot study.

Fear Related to COVID-19 Scale

The COVID-19 Fear Scale was a seven-item questionnaire designed by Ahorsu et al. (2020) to measure COVID-19 fear in the general public. On a five-point scale, 1 = "strongly disagree," 2 = "disagree," 3 = "neutral," 4 = "agree," and 5 = "strongly agree." Higher scores indicate a higher level of fear related to COVID-19, whereas low scores indicate a low rate of COVID-19 fear. The scale has sufficient concurrent validity; nonetheless, the Fear of COVID-19 Scale has Cronbach's alpha value of 0.82 and test-retest reliability of 0.72, according to the authors. For this study, Cronbach's alpha was 0.82.

Situational Humor

This study used 21 items situational humor response questionnaire adopted by Martin (1996) to measure situation humor. This scale has 21-item scale use to test the sense of humor of people in specific situations. This scale was rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and Cronbach's alpha is 0.93.

SNS Usage

This study used Social Network Sites Usage and Needs Scale adopted by Ali et al. (2020). This scale contains 29 items and minor changes were made in scale statements to relate to the particular context of COVID-19. All statements were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and Cronbach's alpha is 0.91.

DATA ANALYSIS

The data were entered and analyzed using SPSS software (Version 24). The data were checked for missing information and outliers first. We did not have any missing data since each question on the e-survey had a star next to it, and participants could not go on without answering the preceding question. Outliers were visually inspected for scattered plot diagrams, but no outliers were found. Frequencies (n), percentages (%), means (M), SDs, and median were utilized as descriptive statistics. Inferential statistics approaches such as independent samples t-tests and variations among demographic subgroups were used to categorize differences in demographic data. The association between the outcome variables (SNS usage, situational humor, and fear related to COVID-19) was further investigated by using Pearson's moment correlation, multiple linear regression, mediation analysis, t-test, and the one-way ANOVA. The statistical significance level was set to $p < 0.001$.

TABLE 1 | Cronbach's alpha reliability analysis of scales.

Variables	K	A
Pilot study		
SNS usage	29	0.79
Situational humor	21	0.80
Fear related to COVID-19	7	0.88
Full-scale study		
SNS usage	29	0.83
Situation humor	21	0.85
Fear related to COVID-19	7	0.82

(N = 1,200); SNS, social networking sites.

TABLE 2 | Descriptive statistics and correlations for study.

Variables	1	2	3
Pilot study			
F-COVID-19	–		
Situational humor	−0.60**	–	
SNS usage	−0.47**	0.57**	–
Full-scale study			
F-COVID-19	–		
Situational humor	−0.56**	–	
SNS usage	−0.40**	0.37**	–

***p < 0.001; SNS, social networking sites.*

Reliability Test

Table 1 showed the reliability analyses of scales, with the SNS usage, possessed reliability of 0.79, indicating fascinating reliability. The situational humor had a reliability of 0.80, which was outstanding, and the Fear Related to COVID-19 Scale had a reliability of 0.88, which was exceptional in a pilot study.

In this study, **Table 1** showed the reliability analyses of scales in which the reliability of SNS usage was 0.83, which shows good reliability. Reliability of situational humor 0.85, which was also excellent reliability, and the reliability of Fear Related to COVID-19 Scale was 0.82 which was good reliability.

Descriptive Statistics and Correlation

Correlations were computed to investigate the relationships between SNS usage, situational humor, and fear related to COVID-19 (see **Table 2**).

Table 2 revealed that pilot study indicates that fear related to COVID-19 was significant negatively associated with situational humor ($r = -0.60$, $p < 0.001$) and SNS usage ($r = -0.47$, $p < 0.001$). While situational humor was positively associated with SNS usage ($r = 0.57$, $p < 0.001$).

For full-scale study, fear related to COVID-19 was significantly negatively associated with situational humor ($r = -0.56$, $p < 0.001$) and SNS usage ($r = -0.40$, $p < 0.001$). SNS usage was positively associated with situational humor ($r = 0.37$, $p < 0.001$).

TABLE 3 | Regression coefficients of SNS usage and humor on fear related to COVID-19.

Variables	B	*SE*	*T*	*p*	95%CI
Constant	48.89	0.67	73.86	0	[47.69, 50.29]
SNS usage	−0.12	0.01	−8.47	0	[−0.16, −0.09]
Situational humor	−0.26	0.01	−19.0	0	[−0.27, −24]

SNS, social networking sites.

TABLE 4 | Regression analysis for mediation of SNS usage between situational humor and fear related to COVID-19 disease.

Variable	*B*	95%CI	*SE*	*β*	R^2	ΔR^2
Step 1					0.31	0.31***
Constant	45.67***	[44.59, 46.74]	0.56			
Situational humor	−0.30***	[−0.33, −0.28]	0.01	−0.56***		
Step 2					0.35	0.04***
Constant	47.99***	[47.69, 50.30]	0.66			
Situational humor	−0.26****	[−0.29, −0.24]	0.014	−0.48***		
SNS usage	−0.12***	[−0.15, −0.95]	0.016	−0.21***		

****p < 0.001; SNS, social networking sites.*

Regression Analysis

Table 3 shows the impact of SNS usage and situational humor on fear related to COVID-19 in university students. The R2 value of 0.35 revealed that the predictors explained 35% variance in the outcome variable with $F_{(2,\ 1,197)} = 321.84$, $p < 0.001$. The findings revealed that SNS usage significantly predicted fear related to COVID-19 ($\beta = -0.015$, $p < 0.001$), whereas situational humor also significantly predicted fear related to COVID-19 ($\beta = -0.014$, $p < 0.001$).

Table 4 shows the impact of SNS usage and situational humor on fear related to COVID-19 in university students.

In step 1, R2 value of 0.31 revealed that situational humor explained 31% variance in the fear related to COVID-19 disease $F_{(1,\ 1,198)} = 593.98$, $p < 0.001$. The findings revealed that situational humor significantly negatively predicted fear related to COVID-19 disease ($\beta = -0.56$, $p < 0.001$). In step 2, the R2 value of 0.35 revealed that situational humor and SNS usage explained 35% variance in the fear related to COVID-19 with $F_{(1,\ 1,198)} = 321.84$, $p < 0.001$. The findings also verified that SNS usage ($\beta = -0.48$, $p < 0.001$) significantly negatively predicted fear related to COVID-19 disease ($\beta = -0.21$, $p < 0.001$). The ΔR2 value of 0.04 revealed 4% change in the variance of model 1 and model 2 with $\Delta F_{(1,1,198)} = 71.80$, $p < 0.001$. The regression weight for situation humor subsequently reduced from model 1 to model 2 (−0.56 to −0.48) but remained significant which confirmed the partial mediation. More specifically, situational humor has direct and indirect effects on SNS usage.

Gender Perspective Mean Analysis

Table 5 revealed significant mean differences on SNS usage with $t_{(1,198)} = 3.56$, $p < 0.001$. Findings showed that male students exhibited higher score on SNS usage ($M = 42.84$, $SD = 2.61$) as compared to female students ($M = 41.67$, $SD = 2.67$). The value of Cohen's d was 0.20 (=0.20) which indicated a small effect. The findings revealed significant mean differences in situational humor with $t_{(1,198)} = 3.87$, $p < 0.001$. In addition, male students exhibited higher score on situation humor response ($M = 41.78$, $SD = 2.66$) as compared to female students ($M = 41.56$, $SD = 2.93$). The value of Cohen's d was 0.22 (<0.40) which indicated medium effect.

Table 6 showed the mean, standard deviation, and F values for SNS usage, situational humor, and fear of COVID-19 disease across education groups. Results indicated significant mean differences across education groups on SNS usage $F_{(3, 1,197)} = 2.67$, $p < 0.001$. Findings revealed that MSc students exhibited higher scores on SNS usage as compared to the others three education groups (BS students, MS students, and PhD students). The value of Cohen's d was 0.44 (<0.50) which indicated a small effect size. *Post-hoc* comparisons indicated significant between-group mean differences of each group with the other three groups.

Results indicated significant mean differences across education groups on situational humor $F_{(3, 1,197)} = 2.63$, $p < 0.001$. Findings revealed that PhD students exhibited higher scores on SNS usage as compared to the others three education groups (BS students, MSc students, and MS students). The value of Cohen's d was 0.46 (<0.50), which indicated a small effect. *Post-hoc* comparisons indicated significant between-group mean differences of each group with the other three groups.

Moreover, results indicated significant mean differences across education groups on fear of COVID-19 disease $F_{(3, 1,197)} = 2.10$, $p < 0.001$. Findings revealed that MS students exhibited a higher score on fear of COVID-19 disease as compared to the others three education groups (BS students, MSc students, and PhD students). The value of Cohen's d was 0.43 (<0.50), which indicated a small effect. *Post-hoc* comparisons indicated significant between-group mean differences of each group with the other three groups.

TABLE 5 | Mean comparison of male students and female students on SNS usage, humor, and fear related to COVID-19 disease.

	Male		Female				
Variables	***M***	***SD***	***M***	***SD***	$t_{(3, 12)}$	***P***	**Cohen's *d***
SNS usage	41.84	2.61	41.29	2.67	3.56***	0	0.204
SH	41.78	2.66	41.56	2.92	3.87***	0	0.229
FCV-19	32.78	1.47	33.09	1.61	–3.84**	0.001	0.201

**** indicate the higher significance value of variables.*

DISCUSSION

The study aimed to gain a better understanding of the impact of SNS usage in mediating the fear of a COVID-19 pandemic and situation humor. Although other researchers have looked into the influence of COVID-19 on individuals and employees (Cao et al., 2020; Zheng et al., 2020; Kumar et al., 2021), this study differs in that it studied the influence of COVID-19 on university students in a developing country (i.e., Pakistan) by looking at gender and class perspectives. Four hypotheses were examined in the study, namely, direct and indirect correlations, and also the hypothesized mediation model. COVID-19-related fear appears to be strongly linked to situational humor and SNS usage, whereas situational humor appears to be significantly linked to SNS usage. The results showed that fear related to COVID-19 significantly predicted humor and SNS usage, confirming our hypotheses based on the association between fear related to COVID-19 and situational humor, and also the association between fear related to COVID-19 and SNS usage. Overall, the findings of this study supported all of the proposed hypotheses, and they were consistent with the previous studies (Khan and Khan, 2021; Liu et al., 2021) in the related field.

Theoretical Contribution

This study also adds to the literature on fear, particularly fear triggered by crises (such as COVID-19). The outcomes of this study support the previous research findings that show a detrimental relationship between personal fear, SNS usage, and humor (Lee et al., 2020). The findings of this study revealed a strong positive link between SNS usage and situational humor during COVID-19 crises, which is similar to a prior study that established a positive link between social media and individual humor in a normal setting (Yip and Chau, 2020). A mediating impact of SNS usage was hypothesized in the H3 indirect association between fear related to COVID-19 and situational humor, and the results supported a partial mediation. This differs from the previous research, which indicated that SNS usage fully mediated the relationship between individual anxiety and happiness. This distinctive finding could be the result of unfortunate conditions carried on by the COVID-19 pandemic. The impact predicted in H4 revealed significant mean gender differences in SNS usage, situational humor, and COVID-19 fear, according to the findings of this study.

TABLE 6 | Mean, standard deviation, and one-way ANOVA in SNS usage, situational humor, and fear related to COVID-19 across education groups.

	BS student		MSc student		MS student		PhD student				
Variables	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	$F_{(3, 12)}$	η^2	***Post hoc***
SNSs	41.57	2.64	41.70	2.57	41.10	2.92	41.02	2.54	2.67**	0.44	2>1>3>4
SH	41.61	2.67	41.54	2.81	40.94	3.07	41.88	2.71	2.63**	0.46	4>1>2>3
FCV-19	32.98	1.51	32.87	1.54	33.12	1.73	32.54	1.25	2.10**	0.43	3>1>4>2

*** indicate the significance value of variables.*

As a result, this hypothesis has been proven correct: male students outperform female students in terms of SNS usage and situational humor. According to the findings of this study, female students had a higher fear of the COVID-19 disease than male students. In our society, men were more likely than women to use SNS, namely, blogs, media-sharing sites, social questioning, and humor user reviews. This finding could be explained by the fact that male students are less afraid of COVID-19 than female students, possibly because female students are unaware of daily ablates of COVID-19, resulting in a higher fear than male students. According to the past study, women were also more anxious, had more anxiety symptoms, and were more enamored of COVID-19 than men (Hou et al., 2020).

The impact of educational groups was predicted in the H5, and the results demonstrated significant between-group mean changes in the use of SNS, situational humor, and fear of COVID-19 of each group. Based on their educational level, we divided students into four groups: BS students, MSc students, MS students, and PhD students. The findings found that MSc students scored higher on SNS usage than the other three education groupings. When compared to the other three education groups, PhD students scored higher on situational humor (BS students, MSc students, and MS students). Furthermore, when compared to the other three education groups, MS students scored higher on fear of the COVID-19 disease. Overall, our hypotheses were partially supported by the literature.

Practical Contribution

This study has several practical implications for educators, policymakers, and practitioners. First, this study emphasized the role of pandemic-related fear. This type of fear can have a negative impact on the sense of humor of students and their proclivity to the usage of SNS platforms to connect with like-minded individuals. It is suggested that university administration takes the appropriate steps to strengthen preventive measures among students rather than creating an environment of dread, which can influence not only their psychological health but also their academic performance. Second, the impact of SNS usage on students cannot be underestimated. Fake news and inappropriate usage of SNS, particularly SNS, can damage the sense of humor of an individual during the COVID-19 crisis. A sense of humor is thought to be beneficial in reducing stress. Students, teachers, and university management all take steps to ensure an effective online learning environment in this scenario. Furthermore, the university provides employees with useful online networking platforms where they may share positive news and gain confidence in the horrible condition created by COVID-19 disease. Third, online mentoring classes and counseling sessions for students, particularly undergraduate students, can be beneficial to them in terms of strengthening their situational humor and promoting their confidence and academic performance. Finally, understanding the fear associated with COVID-19 disease and its impact on SNS usage and humor is critical for university administration. Our findings show that female students are more effusive in this situation than male students. Female students, as a result, require more attention and positive measures in both physical and online classes to assure their participation.

Limitation and Future Research Direction

There are some limitations to consider while analyzing the results. The study started with a nonclinical sample. Because clinical volunteers are more likely to experience persistent fear and despair during a pandemic, they should be used in the study. Second, due to the cross-sectional nature of the study, establishing a causal relationship from the data is difficult. Longitudinal and experimental studies are required to learn more about the causal relationships between the variables. In this study, data of these constructs (such as SNS usage, situational humor, and COVID-19) were collected all at once, hence, the chances of common method bias or social desirability may be ruled out. Third, data were gathered through the use of online and SNS applications, and also through email; however, poor Internet connections and a lack of detailed information may limit proper respondent responses; therefore, future studies can collect data physically. Finally, students who are exposed to potential macroaggressions such as ageism, ableism, classism, and racism may experience a conflation of preexisting stresses in addition to COVID-19. As a result, in future research, variables that may be useful in dealing with COVID-19 fear people in the COVID-19 process may be investigated in these specific groups rather than the general population. Finally, due to the nature of deliberate sampling, gender distribution equality was not reached. Future studies should look at gender distribution in the context of a nationally representative poll to tackle this challenge. Furthermore, future studies could solve this issue by utilizing meta-analysis.

CONCLUSION

The current study indicated that COVID-19 fear was negatively connected with SNS usage and situational humor responses, but SNS usage was positively connected with situational humor. Fear related to COVID-19 of students was strongly influenced by their SNS usage and also how they reacted to humorous circumstances. Furthermore, the SNS usage was found to be a partial mediator between fear related to COVID-19 disease and situational humor in the mediation model. Furthermore, when compared to female university students, male students use much more SNS usage and respond to situations with situational humor, whereas fear of the COVID-19 disease of female students is significantly higher. It also found that individuals from different educational backgrounds had significant mean differences in study variables.

DATA AVAILABILITY STATEMENT

The data will be made available upon scholarly request via the first and second authors.

ETHICS STATEMENT

This study and data collection procedures were approved by the Ethics Committee of International Islamic University (https://iiu.edu.pk/default.htm) and School of Management, Wuhan Polytechnic University (https://www.whpu.edu.cn/en/). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

YX and SHas developed research model and wrote the initial draft of this article including introduction, discussion, conceive of the project and oversees. SHas, YX, and SHab contributed data analyses. SHab and SB contributed in both revisions stages of the manuscript. All authors contributed to the article and approved the submitted version.

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Information and Communication Technology and Organizational Performance During Covid-19 Pandemic: The Role of Organizational Commitment, Growth Mindset, and Entrepreneurial Orientation

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The purpose of this study is to assess how information and communication technology (ICT) adoption influences organizational performance (OP) during the Covid-19 pandemic by highlighting psychometric variables such as employees' organizational commitment (OC), growth mindset (GM), and entrepreneurial orientation (EO). Based on the complementarity theory, we built a theoretical framework where OC, GM, and EO mediate the influence of ICT on OP and tested hypotheses proposed. Responses of 297 employees from agriculture cooperatives in Côte d'Ivoire were obtained on the basis of questionnaires which composed the data for this study. The empirical analysis affirmed the significant and positive effect of ICT adoption on OP, and the significant mediating effect of OC and GM in the relationship between ICT adoption and OP. However, the role of EO in mediating the influence of ICT adoption on OP is insignificant. This research increases understanding of the underlying process of the relationship between ICT adoption and organizational performance during the Covid-19 pandemic.

Keywords: ICT adoption, organizational commitment, growth mindset, entrepreneurial orientation, organizational performance

INTRODUCTION

In many organizations, technological advances have completely restructured organizations by making their business processes more efficient and fluid than ever. Particularly, information and communication technology (ICT) has become an essential tool to support and sustain the business. This has led companies to invest in ICT as a strategic resource that can directly influence organizational performance (Hermawan and Suharnomo, 2020). Today, ICT has moved from a traditional administrative support orientation to a competitive strategic weapon (Bobb and Harris, 2011; Knight and Radosevich, 2011), because it not only supports existing business operations of organizations, but also enables new business strategies.

Many studies have examined the impact of ICT on organizational performance (Kariuki, 2015; Wu et al., 2015; Shonubi and Akintaro, 2016). Most of these studies have suggested that ICT plays a critical role in improving the quality, quantity, and sharing of information (e.g., Mohout and Fiegenbaum, 2015; Pérez-López et al., 2019), and this enables organizations to allocate their resources to maximize their goals. Laban and Deya (2019) simplify these assertions, stating that organizations use innovation-enhancing ICT to commercialize their products and increase their competitive advantage. This is supported by many previous researches (e.g., Everett, 2003; El-Gohary, 2012; Oliveira et al., 2014) which show that compatibility can help organizations to achieve better performance. Furthermore, other studies highlight that ICT tools allow organizations to leverage formal and informal networks as well as new marketing tactics and, in some circumstances, changes in sales to access markets (Naidoo, 2010).

However, there are still many open questions regarding the hypothetical positive relationship between ICT adoption and organizational performance (Basri et al., 2018), so caution should be exercised when stating that ICT provides organizations with high performance (Jalagat and Al-Habsi, 2017). Some researchers have observed that misalignment of ICT with operations leads to failure to achieve desired outcomes. Yunis et al. (2017) emphasize the need to understand not only how, but also when and why ICT does or does not improve organizational performance. Such disagreements suggest the importance of understanding "how" and "if" ICTs impact organizational performance. In examining how ICT works in organization, Alshubiri et al. (2019) propose to analyze not only the financial return that ICT brings to the company. This view is supported by Lochovsky et al. (1996) who argue that the use of financial measures, in and of itself, does not fully reflect the benefits that ICT brings to the organization. However, Piabuo et al. (2017) advocate ICTs' integration into human resource management to achieve organizational performance. Their work was based on the effect of ICT usage as a tool for organizational performance through human resources, because ICT can help coordinate human resources, activities, individuals within organizations, and relationships that organizations have at the both intra-organizational and inter-organizational levels.

Overall, the extant literature suggests that the impact of ICT on organizational performance is indirect and that it needs to interfere with other human attributes of an organization to achieve this effect. In this sense, ICTs appear as determinants with significant potential to catalyze other psychometric factors of human resources. This means that ICT capabilities can have a significant impact on firm performance, but only through psychometric attributes of the employees. Several observational studies support this by showing the catalytic and enabling role of ICT (Galve-Górriz and Castel, 2010; Piabuo et al., 2017). However, given that organizational capabilities are many and diverse, research is still needed to clarify and improve the understanding of the enabling role of ICTs on human resources and their impact on outcomes.

This research makes several contributions. First, we provide and test a new explanatory model of the direct and indirect relationships between ICT adoption and the organizational performance through psychometric variables of employees. In this sense, this study contributes to the theoretical understanding of the catalytic and enabling effects of ICTs, which makes us to reinforce the idea that psychological development of employees is essential in the effect of ICTs on the organizational performance. This enables us to not only highlight the effect of ICT in organizations that are often characterized by limited resources, but also emphasize the importance of human attributes catalyzed by ICT adoption which have synergy and significant potential for value creation in organizations.

Second, this study, based on the complementarity theory, incorporates variables such as organizational commitment, growth mindset, and entrepreneurial orientation to understand the enabling capacity of ICT on organizational performance. The complementarity theory provides an entirely different critique by emphasizing that ICTs alone are not enough to revitalize the organizational performance, especially in times of crisis. ICTs need to be complemented by other human attributes such as capabilities, special talent of workers, orientation and proactive spirit of workers, as presented in various studies that link the impact of ICT diffusion on organizational performance to human resources. The human attributes considered in this study include (1) organizational commitment, which is defined as an employee's level of psychological attachment to his or her organization and, therefore, willingness to strive to achieve organizational goals (Meyer and Allen, 1991); (2) growth mindset, which is defined as an individual's state of mind that influences outcomes, through a series of socio-cognitive motivators (Dweck, 2006; Boyd, 2014); (3) entrepreneurial orientation, which is defined as the entrepreneurial posture and strategic direction adopted by employees to seize opportunities and is normally manifested by innovative behavior, proactivity and risk-taking propensity, aggressiveness, and competitiveness (Galve-Górriz and Castel, 2010; Gargallo and Galve, 2012). To the best of our knowledge, studies that consider relationships between ICT, OC, GM, EO, and OP are rare.

Third, this study provides a piece of evidence on how ICT adoption works on organizational performance in a very particular context of Covid-19. Despite the existence of studies, little attention has been paid on how the adoption of modern technology affects the organizational performance in times of crisis. Though ICTs have been widely adopted with the development pandemic around the world, the impact of their adoption on the organizational productivity has not received adequate research attention during this period. This research fills the research gap and provides management implications for organizations to adapt their strategies, processes, structure, and culture in order to maximize the contribution of ICT in this pandemic period.

This paper is organized into six sections, beginning with the introduction. "Related Theory, Literature Review and Research Hypotheses" presents the related theory, literature review, and hypothesis development. The methodology of the study is presented in "Materials and Methods." "Structural Model" presents the results obtained. "Discussion and Conclusion" provides the discussion and the conclusions, and limitations and future research are provided in "Limitations and Future Research."

RELATED THEORY, LITERATURE REVIEW, AND RESEARCH HYPOTHESES

Complementarity Theory

It is demonstrated that ICTs reduce transaction and coordination costs, therefore increasing transaction value. They enable businesses to reduce their coordination costs in comparison with their procurement and inventory costs, as well as their coordination costs with suppliers, by improving external communication, reducing inefficiencies caused by a lack of coordination between parties involved, and increasing the speed and reliability of data processing and transfer. Other recent studies on the subject have found that ICT has a beneficial impact on a variety of business performance measures (Bayo-Moriones et al., 2013; Tarutė and Gatautis, 2014; Wachira et al., 2014; Kariuki, 2015; Sabherwal and Jeyaraj, 2015; Mithas and Rust, 2016).

However, the complementarity theory, on which our research is based, proposes that ICT alone is insufficient to provide good productivity, efficiency, and organizational performance (Piabuo et al., 2017). Other human characteristics such as capabilities, specific skills, orientation, and a proactive mindset must be considered, without which organizational effectiveness cannot be achieved (Gargallo and Galve, 2012).

Despite the fact that ICT is widely available, they might be difficult to provide a sustainable competitive advantage on their own. In light of this philosophical divide, recent empirical literature has begun to reconsider the relationship between ICT and a wide range of additional factors. Many scholars have shown that the benefits of using ICT are closely linked to the expression of factors inside the organizational employees who use them (Sarayani et al., 2014). Arvanitis and Loukis (2016) provide empirical evidence of the positive influence of ICT, human capital, and new organizational practices on workplace productivity in Greece and Switzerland. Black and Lynch (2001) investigate the influence of information technology, human resource management practices, and business reorganization on productivity. As a result, ICT will have a significant influence on the organizational performance owing to the adequacy of these human resources (Galve-Górriz and Castel, 2010; Gargallo and Galve, 2012). Following the review of literature, we will focus our attention on the factors are related to human resources, such as organizational commitment, growth mindset, and entrepreneurial orientation.

Hypotheses Development

ICT Adoption and Organizational Performance

ICT's strategic role is to develop new services and capacity which gives any organization strategic advantages over existing competitive market forces. A company must use its ICTs appropriable and must conform to its internal resources and organizational processes to achieve its long-term success and sustainability (Wu et al., 2015). The choice of ICT provides the compatibility, relative advantage, observability, complexity, and testability for organizations (Everett, 2003).

Compatibility is the dimension that conforms to current values, past experiences, and potential adopters' needs (Sahin, 2006). If ICTs are compatible with the needs of employees, uncertainty will be reduced, and the rate of adoption will increase. The degree to which an innovation is perceived to be superior to the idea it replaces is referred to as relative advantage. Furthermore, if employees see that technology can add value to their tasks, they will undoubtedly use it (Lee et al., 2019). The successful incorporation of technology into organizations results in the benefits they provide (Shonubi and Akintaro, 2016).

Observability is the result of visible innovation to other adopters. A role model (or peer observation) appears to be a key motivator in the adoption and diffusion of technology by other employees (Everett, 2003). According to research, all of these factors influence the likelihood of employees adopting a new technology in their operations.

Complexity is the degree to which an innovation perceives itself to be difficult to understand and apply, and the extent to which an innovation can be tested on a limited basis is referred to as testability (Everett, 2003). The more times an innovation is tried, the faster it will be adopted.

However, while ICTs have a wide range of applications and benefits for organizational competitiveness, the manner in which these benefits manifest depends on the person–organization–equipment relationship (Sibanda and Ramrathan, 2017). Indeed, it must be acknowledged that some organizations are dissatisfied with the use of these tools as a result of a misalignment of ICT use in these organizations (Silva and Souza Neto, 2014). At this stage, ICT can interfere with organizational performance (Kim and Kim, 2020), which can have a negative impact on costs, sales, and productivity (Wu et al., 2015). Based on this, we believe that ICT, as a strategic tool, has an impact on organizational performance and propose the following hypothesis:

> *Hypothesis* 1(H1): *ICT adoption is positively related to OP.*

ICT Adoption and Organizational Commitment

Several studies attest to the possible relationship between communication and commitment (Allen, 1992). The literature on the ICT–commitment relationship has been primarily based on the theory of social exchange, which explains a mechanism of continuous exchanges between various parties. Starting with the theoretical principle of social exchanges, which is based on the concept of reciprocity, the receiver receiving important information from the sender is subject to the full force of the reciprocity law (Emerson, 1976).

A leader who communicates frequently by providing more accurate and timely information improves the work environment and, as a result, increases employee commitment to the organization (Mathieu and Zajac, 1990). Sharing information about the tasks to be completed is still an important prerequisite for organizational commitment. Communication variables can explain more than half of the variance in organizational commitment, and attention and insight, in particular, are communicative predictors of organizational commitment (Hayase, 2009). Furthermore, communication serves as a catalyst for employee attitudes, thereby creating the conditions for commitment (Wiley, 1988; Allen, 1992; Rodwell et al., 1998; Postmes et al., 2001).

This is consistent with the conclusion that the satisfaction of the communication relationship strengthens the individual's sense of belonging to the organization. When researchers investigated the role of communication, they discovered that openness and relevance of information predicted commitment but not participation in decision-making (Trombetta and Rogers, 1988; Putti et al., 1990). As a result, we propose the following hypothesis:

> *Hypothesis* 2(H2): *ICT adoption is positively related to OC of employees.*

ICT Adoption and Growth Mindset

Organizational performance can be defined as the outcome achieved in relation to the objectives, the company's strategy, and/or the parties' expectations. Companies need tools and resources to develop their mobility and creativity in order to be successful. Communication channels have been shown to be one of the most important means in business because they play a critical role in achieving a common goal of the organization's objectives, particularly within a team (Olugbode et al., 2007; Tomal and Jones, 2015).

This adoption of new digital tools or mobile applications results in organizational technological change, which is strongly influenced by an open line of communication between management and employees, a growth mindset, a culture of freedom to choose and innovate, and a shared vision and goal. A strategy like this also contributes to the development of a "culture of growth mindset" which embraces constant change and allows employees to contribute and engage within their organizations.

> *Hypothesis* 3(H3): *ICT adoption is positively linked to GM of employees.*

ICT Adoption and Entrepreneurial Orientation

Several studies have shown that ICTs can play an important role in a company's entrepreneurial orientation (Kietzmann et al., 2013; Sena, 2013). An organization that chooses ICT makes an important decision, often of a strategic nature, allowing it to adjust, integrate, reconfigure, and recreate its internal and external skills in order to gain a competitive advantage in a constantly changing business environment.

Thus, ICTs facilitate interaction with and among stakeholders, resulting in greater agility in specific activities, increased productivity, efficiency, task control, and financial benefits (Jiya, 2019; Pérez-López et al., 2019). Entrepreneurial individuals, for example, associate ICT with many personality traits, including innovation, risk taking, proactivity in the sense of doing what is necessary to bring their ideas to fruition, and responsibility for accepting success or failure (Covin and Slevin, 1989; Morris and Sexton, 1996).

Furthermore, the implementation and creative use of ICT is critical to the success of firms. According to the definition, EO is the process of creating value in conjunction with a unique combination of concepts in order to capitalize on an opportunity (Morris and Sexton, 1996). A possible correlation with strategic positioning was demonstrated by previous studies, implying that entrepreneurship is perceived as a lever of sustainable development for organizations.

So, ICT has the potential to contribute to the development of EO in organization. In this context, the hypothesis is framed as follows.

> *Hypothesis* 4(H4): *ICT adoption is positively linked to EO of employees.*

Entrepreneurial Orientation and Organizational Performance

The EO refers to the process of identifying and exploring market opportunities (Venkataraman and Shane, 2000). Several researchers have operationalized the EO through three dimensions: innovation, proactivity, and risk acceptance (Lumpkin and Dess, 1996). Innovation refers to the desire to support and create opportunities for creativity and experimentation in the development of new products. Proactivity is the ability of companies to grow and not just seize market opportunities. The acceptance of risk is reflected in the willingness of top management to allocate a significant part of the company's resources to new projects or to go into debt in the development of new opportunities. Thus, companies with a strong EO have the ability to manage environmental uncertainties to their advantage to explore opportunities, renew and rejuvenate companies (Covin and Slevin, 1989).

However, companies that do not pay attention to performance indicators and management compromise operating results and their sustainability in the market. Organizations tend to be more seriously affected by changes in the environment, at the level of competitors, suppliers, customers, and other organizations (Wang et al., 2014). Companies need to consider the entrepreneurial posture as an indispensable factor in acquiring skills and, therefore, a competitive advantage in the face of rapid changes in market demands. Thus, based on these researches, we make the following hypothesis:

> *Hypothesis* 5(H5): *EO of employees is positively linked to OP.*

Growth Mindset and Organizational Performance

The state of mind was viewed as a required attitude for achieving objectives, which has a significant impact on performance assessments (Heslin et al., 2005; Black and Allen, 2017). A growth mindset supports goal formulation in the first place, goal exploitation in the second, and goal tracking in the third through acquiring a new skill or mastering a task (Dweck, 2006; Yeager and Dweck, 2012). There is a strong link between a growth mindset and self-efficacy (Chunting et al., 2020). As a result, employees with a growth mindset are seen as more resilient in the face of adversity, challenges, and reversals (Yeager and Dweck, 2012). It was believed that individuals' growth mentality is directly related to their willingness to take risks, face challenges, and work hard (Dweck, 2006). The higher a person's mental state, the more significance she places on problems and the more time and effort she devotes to improving her condition (Liu et al., 2014). It has been demonstrated, for example, that increasing effort, energy, and tenacity in the execution of learning activities encourages learners to provide their best (Yeager et al., 2019). Persons with a growth mindset try new strategies and ask for help when they need it, in addition to working harder, which is a proven predictor of success (Claro et al., 2016).

As a result, growth mindset of employees can be a substantial factor in promoting organizational performance (Heslin et al., 2006; Boyd, 2014; Asbury et al., 2016).

Hypothesis 6(H6): *GM of employees is positively linked to OP.*

Organizational Commitment and Organizational Performance

Organizational commitment remains one of the cornerstones of organizations because of the attitudes and perceptions it generates among the actors of an organization (Folorunso et al., 2014). Existing meta-analyses have indicated that organizational commitment is associated with organizational performance, which is one of the most critical objectives of an organization (Mathieu and Zajac, 1990; Jaramillo et al., 2005).

Employees with highly engaged individuals perceive and consider the objectives, values, and interests of their organizations as their own. Therefore, they make sincere efforts to meet the expectations of the organization by working harder. These efforts are perceived through improved performance, in daily tasks by increasing the quality of employee attitudes and behavior (O'Reilly and Chatman, 1986; Baca-Motes et al., 2013; Grashuis and Cook, 2019). This consolidated commitment can spread to the collective level, to all employees through a social contagion effect, thus forming a "common ground" (Burt, 1987).

If collective commitment results from social interactions within an organization, employees may be inclined to be loyal to the organization, while investing their cognitive, emotional, and physical resources to achieve organizational goals (Burt, 1987; Ostroff, 1992). This collective commitment fosters peer-to-peer support that provides an increased level of cooperative behavior to achieve the organization's objectives. These behaviors promote quality interactions that are conducive to the achievement of various work-related tasks and cohesion within an organization. Thus, improved attitudes and behaviors would directly contribute to increased organizational efficiency and performance (Andrew, 2017; Ehijiele, 2018).

Hypothesis 7(H7): *OC of employees is positively linked to OP.*

The Effect of Organizational Commitment in the ICT-OP Link

As mentioned above, the relationship between ICT and OP has been theoretically and empirically validated in previous work (Tarutė and Gatautis, 2014; Pérez-López et al., 2019). Previous research has shown that ICT adoption can influence performance through organizational commitment (Allen, 1992; Trechter et al., 2002; Sarayani et al., 2014). Since the use of ICT offers advantages by replacing part of human work in an organization on the one hand, and on the other hand, by bringing about greater participation and involvement of employees in new forms of work and in the opening of interpersonal relationships. They are likely to affect positive employee attitudes, such as their commitment to the organization.

If an organization regularly distills information within it, employees will feel more confident, more secure, in order to accomplish their tasks effectively and efficiently, which would increase performance.

Hypothesis 8(H8): *ICT influences OP through OC of employees.*

The Effect of the Growth Mindset in the ICT-OP Link

The adoption of ICT in a growth mindset allows employees to improve their information processing and strategic learning skills, allowing them to adapt coordination to changes and environmental dynamics through the resynthesize of resources (Kariuki, 2015; Campbell et al., 2020). It is expected that the effect of ICT on organizational performance relies on employees' growth mindset.

Hypothesis 9(H9): *ICT influences OP through GM employees.*

The Effect of Entrepreneurial Orientation in the ICT-OP Link

ICT has the potential to contribute to the development of entrepreneurial orientation. This perspective gives ICT the role of catalyst that affects perceptions, attitudes, and entrepreneurial behavior in the organization, which is categorized at the micro level (Scott, 1995), and in turn significantly influence various institutional outcomes, such as organizational performance. Thus, we expect the effect of ICT to have a direct impact on organizational performance through the micro-variable of employees' entrepreneurial orientation. In other words, EO can mediate the ICT-OP link.

Hypothesis 10(H10): *ICT influences OP of through EO of employees.*

Overall, we propose that impact of ICT on OP through a series of indirect effects of OC, GM, EO (see **Figure 1**).

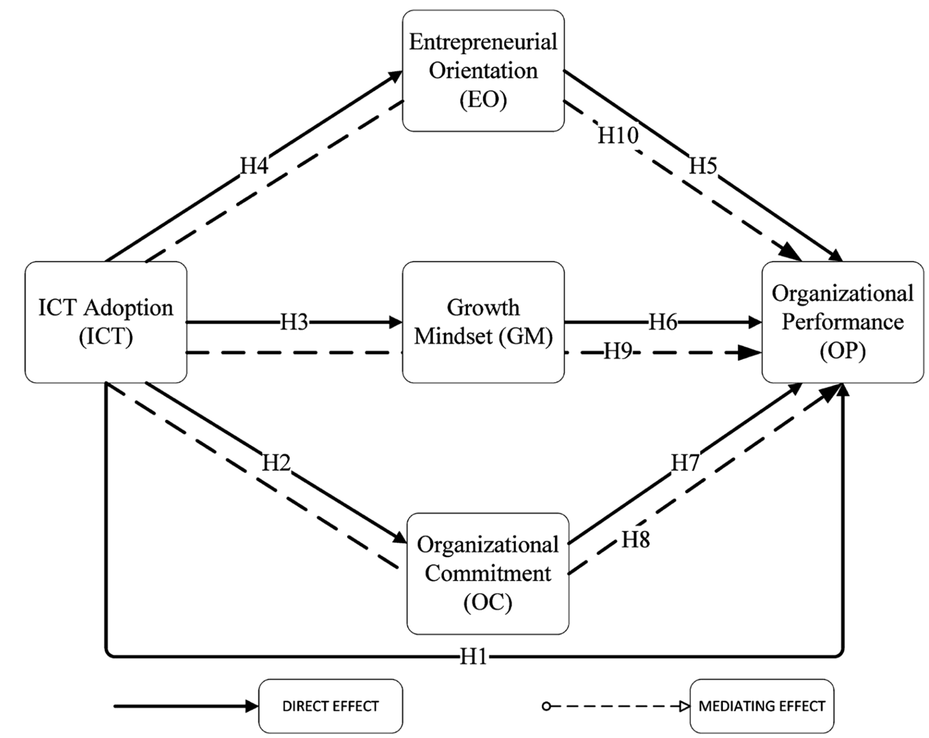

FIGURE 1 | The proposed theoretical framework.

MATERIALS AND METHODS

Data Collection

We used an online survey system to collect data from employees who worked in Ivorian agricultural cooperatives. Two reasons explain why we focus on the agricultural cooperatives in Côte d'Ivoire. First, comparing to those in other industries, most agricultural organizations do not develop technological planning strategies in Côte d'Ivoire. This weakness was quickly highlighted by the onset of the pandemic which considerably impacted their functioning. During the pandemic, agricultural organizations initiate more firmly than ever to embrace ICTs and integrate them into their business. This provides us an ideal setting to examine the impact of ICT adoption on organizational performance through employees' psychological evolution in this transition period. Second, the scale of agricultural organizations in Côte d'Ivoire provides us reliable sample. It is estimated that 37.3% of the Ivorian national GDP comes from agro-industry, according to the Ivorian Ministry of Agriculture. There are around 3,000 professional agricultural organizations, known as cooperatives, scattered across the country. These agricultural professional organizations include Umbrella associations, Coop-CA (Cooperative Society with Board of directors with 15 or 250), agricultural SMES (with 10 to 250 employees), SCOOPS (simplified cooperative with 5 to 15 employees), and VSEs (very small enterprise with less than 10 employees). The cooperatives generate around 100,000 direct jobs, with around 900,000 and 4,000,000 people directly and indirectly linked to these organizations.

TABLE 1 | Description of the respondents.

Characteristics of respondents		Frequency (*n*)	Percentage (%)
Gender	Male	201	67.7
	Female	96	32.3
Age	21–29 years old	62	20.9
	30–39 years old	126	42.4
	40–49 years old	61	20.5
	Above 50 years old	48	16.2
Marital Status	Single	60	20.2
	Married	177	59.6
	Divorced	39	13.1
	Widower	21	7.1
Education Background	Primary	39	13.1
	High School	182	61.3
	Diploma	38	12.8
	Bachelor's Degree	21	7.1
	Other	17	5.7
Seniority	1–3 years	35	11.8
	4–6 years	107	36.0
	7–10 years	73	24.6
	Above 10 years	82	27.6

The survey targeted respondents from several areas in Côte d'Ivoire (namely Abidjan and Adzopé, Daoukro, Tiassalé) in October 2020. To reduce the harmful effects of sampling bias, we used a method of simple random sampling to select the appropriate quota according to the following four categories: transformation, commercialization, production, and services. After 4 weeks investigation, our survey remained online for an additional 15 days, allowing respondents to complete it on time. After that, we closed the survey and removed incomplete and missing data from the raw data set. Specifically, of the 378 questionnaires administered, 297 usable questionnaires were obtained, a response rate of 78.57%. The results of the demographic analysis are detailed and presented in **Table 1**.

Measures

A self-administered and structured questionnaire was developed, pre-tested and finally administered to respondents while ensuring the anonymity and confidentiality of their responses. A five-point Likert scale has been used to measure variables of research constructs as recommended in previous work (Hamed, 2019). The Likert scale ranged from strongly disagree to strongly agree, coded 1 to 5, respectively. In total, the measurement items for the five multi-item constructs consisted of 19 items that were derived from previous studies and modified to fit the research context. The questionnaire also contained respondent demographics: age, gender, education background, marital status, seniority. Data were analyzed using the Structural Equation Modeling (SEM) with the help of SPSS 21, Amoss21 and Smartpls 3.27.

In order to critically evaluate the influence of ICT on organizational performance of agricultural cooperatives, the following outcomes of SEM-based statistical tests help to justify or nullify the hypothesis of this research. First, before any statistical analysis, all negative statements were recoded. Second, a factor analysis was performed on all ICTs statements and all other categories. For characteristics of ICT adoption, 04 factors (Relative advantage, Compatibility, Complexity, Observability) were produced out of 05. For organizational commitment characteristics, 03 factors (Affective, Normative, Internationalization) were produced out of 05. For characteristics of entrepreneurial orientation, 03 factors (Innovation, Proactivity, Risk-taking) were produced out of 05. For characteristics of growth mindset, 03 factors (to persist or give up after failures, to view the effort as fruitful or unsuccessful, and to learn or avoid comments and criticisms) were produced out of 04. For the characteristics of organizational performance, 06 were produced out of 13. Based on the statements of each factor, the factors were then labeled.

Information and Communication Technology as the Independent Variable

ICT adoption has been assessed by employees of agricultural cooperatives using Roger's DOI scale (Everett, 2003). The scale tends to consider a stakeholder perspective, which consists of items on various modes of adoption for various stakeholders. The scale has four dimensions: (1) Relative advantage (2) Compatibility (3) Complexity (4) Observability. Cronbach's alpha was 0.924.

Organizational Commitment as the 1st Mediator

To measure organizational commitment, we used a combined 3-item model of O'Reilly and Chatman (1986) and Meyer and Allen (1991). Examples of items are: (1) "I really feel that the issues in my organization are mine" (2) "I feel a strong sense of belonging to my organization" and (3) "When I am part of an organization, I feel concerned by the organization itself and not by the bonds of friendship with colleagues." Cronbach's $\alpha = 0.959$.

Growth Mindset as the 2nd Mediator

Growth Mindset is based on a classic preference scale of Dweck (2006) and focuses on the tendencies to persist or give up after failures, to view the effort as fruitful or unsuccessful, and to learn or avoid comments and criticisms. The scale of operationalized measures adapts to the following three items: (1) "When I fail at my job, I see it as an opportunity to learn more" (2) "Comments and criticisms from others motivate me to move forward" (3) "If there is something that I am not very good at, I do not give up until I succeed." Cronbach's $\alpha = 0.878$.

Entrepreneurial Orientation as the 3rd Mediator

Our explanatory variable entrepreneurial orientation symbolized by the entrepreneurial orientation is a composite index which apprehended entrepreneurial intensity within agricultural cooperatives surveyed from a modified version of the index (Shan et al., 2016; Dao, 2018). This index is made up of three dimensions: the propensity to innovation, the propensity to take risks, the propensity to be proactive (Dao, 2018). The questionnaire is reviewed by a research specialist in strategy management and tested on a manager who participates in strategic decisions. Examples of items are: (1) "My organization is embarking on very risky projects" (2) "My organization innovates very often" and (3) "My organization initiates actions to which competitors respond." Cronbach's $\alpha = 0.928$.

Organizational Performance as Dependent Variable

The organizational performance variable was assessed across six items (Cronbach's $\alpha = 0.936$). The examples of items come from previous research and consisted of: (1) "Our organization is more efficient and productive than our competitors" (2) "Our management performance is superior to that of our competitors" (3) "Our financial performance is excellent compared to our competitors" (4) "The return on investment is enormous compared to our competitors" (5) "Value added per employee in our organization is well above the industry average." and (6) "Productivity of employees is much higher than the industry average" (Kontogeorgos et al., 2018).

Analytical Strategy

To assess whether measures of ICT adoption included the four-variable structure, we performed confirmatory factor analysis (CFA) to check the validity of the measurement model for our research variables (Marsh et al., 2020; Crocetta et al., 2021). We performed Chi-square difference tests sequentially to compare the quality indices of our five-factor model to other alternative models (i.e., four-factor, three-factor models, and two factors, respectively). This paper used the comparative goodness-of-fit index (CFI), the Tucker–Lewis index (TLI) greater than 0.90 and the approximate root mean square error (RMSEA) less than or equal to 0.06, the (PCLOSE) greater than 0.05 as criteria for evaluating goodness-of-fit indices (Shi et al., 2019). Additionally, we performed a SEM analysis by building a mediation model to test our structural model. We used the maximum likelihood estimator (ML) to perform the SEM. Finally, to assess our mediation hypothesis, we performed a Bootstrap procedure using the 95% bias corrected confidence interval (IC) to assess the mean indirect mediation. If the IC excludes 0, the indirect effects are interpreted as statistically significant at a level of 0.05 (Özdil and Kutlu, 2019).

RESULTS

Descriptive Statistics

Table 2 presents descriptive statistics for all variables. As shown in the table, the mean value of ICT was 3.32 with a standard deviation of 0.96. The mean of OC was 3.66 with a standard deviation of 1.10. The mean value of GM was 3.27 with a standard deviation of 1.16, and the mean value of EO was 3.56 with a standard deviation of 1.22. The mean value of OP was 3.47 with a standard deviation of 0.99. The skewness and kurtosis for all constructs in the study show the adequate range of ±2, which agrees with the symmetry of the sample distribution (Andrews et al., 2020).

Structural Model

Confirmatory Factor Analysis of Variables

This research employs five major constructs (ICT, OC, GM, EO, and OP) as major constructs. The study first examines the different reliability of the elements for the measurement model. Initially, the associations between the variables were evaluated by a Pearson correlation analysis (Anderson and Gerbing, 1988). Moreover, CFA has helped to understand that the measurements of the constructor are consistent (Idris et al., 2010; Marsh et al., 2020). The analytical result was used to test whether the data met the hypothetical measurement model. To do this, we conducted a CFA for the 19 elements to verify the quality of the fit of the measurement model of the five variables and we also built three mediation models between ICT adoption and performance. In the conceptual structure, OC, GM, and EO mediated the ICT-OP link and the statistical results based on the model fit indices showed that all values of the CFA indicators (i.e., CMIN/DF, IFI, GFI, CFI, and RMSEA) are within their threshold of excellence. As shown by the observed value of CMIN/DF is 1, 387, which is less than 3, the TLI value is 0.988 (greater than 0.90), the CFI value is 0.991 (greater than 0.90), the NFI value is 0.968 (greater than 0.90), the GFI value is 0.940 (greater than 0.80) and RMSEA 0.036 (greater than 0.08), the Pclose value is 0.973 (greater than 5).

In addition, a multi-collinearity bias was performed between different variables. We also looked at variance inflation factors (VIF) and tolerances. For ICT, OC, GM, EO, the results are 1.56, 1.38, 1.46, 1.82, respectively, and the tolerance values for these variables are 0.72, 0.51, 0.42, and 0.36, respectively. The VIF scores are below 10, and the tolerance scores are above 0.2. We suggest that ICT, OC, GM, EO are free from the multi-collinearity problem. This means that all variables are effectively and completely uploaded to the CFA model, as shown in the following **Figure 2**.

Results of the Mediation Analysis

We performed SEM analyses and a Chi-square difference test between the full mediation model and the partials mediations models. Our full mediation model is excellent (CMIN = 185.852; *df* = 134; CMIN/DF = 1.387; CFI = 0.991; TLI = 0.988; NFI = 0.986; GFI = 0.940; RMSEA = 0.36; Pclose = 973). The partial mediations models include three indirect paths that connect ICT, OC, GM, EO, and OP. The first partial mediation model (ICT-OC-OP) fits perfectly (CMIN = 131.146; *df* = 90; CMIN/DF = 1.457; CFI = 0.991; TLI = 0.989; RMSEA = 0.39; PCLOSE = 890). The second model of mediation involves an indirect path ICT-GM-OP. The partial mediation model also fits perfectly (CMIN = 93.615; *df* = 54; CMIN = 1.734; CFI = 0.991; TLI = 0.986; RMSEA = 0.050; PCLOSE = 0.487). The third model of mediation involves an indirect path ICT-EO-OP. The partial mediation model also fits perfectly (CMIN = 66.930; *df* = 27; CMIN = 2.479; CFI = 0.984; TLI = 0.986; RMSEA = 0.071; PCLOSE = 0.53). The result of our Chi-square difference test between models demonstrated that the full mediating model was significant and remains the best. Therefore, we suggest that the three variables have an adequate level of discriminant validity.

Test of Hypotheses

Table 3 analyzes the construction assumptions, including their beta, mean, standard deviation, *t*, and *p* values.

According to the study's findings, the reliability and validity of the scales measured for OP are 0.855, 0.897, 0.902, 0.975,

TABLE 2 | Descriptive statistics.

	N	Min	Max	Sum	Mean		*SD*	Skewness		Kurtosis	
	Stat	Stat	Stat	Stat	Stat	Std. Error	Stat	Stat	Std. Error	Stat	Std. Error
ICT	297	1.00	5.00	986.25	3.32	.056	0.96	−0.390	0.141	−0.537	0.282
OC	297	1.00	5.00	1087.17	3.66	.064	1.10	−0.621	0.141	−0.527	0.282
GM	297	1.00	5.00	972.33	3.27	.067	1.16	−0.367	0.141	−0.744	0.282
EO	297	1.00	5.00	1058.43	3.56	.071	1.22	−0.608	0.141	−0.816	0.282
OP	297	1.00	5.00	1029.14	3.47	.058	0.99	−0.474	0.141	−0.822	0.282

and 0.911, respectively. The path coefficients suggested by the model provide empirical support for the 10 hypotheses tested in this study because this technique can be used to test multiple levels of a theoretical framework. Analyses show that ICTs have a positive impact on the organizational performance of agricultural cooperatives.

The results for hypothesis 1 (H1) show a beta coefficient of 0.667, a standard error of 0.049, a *t*-value of $13.669 > 2$, and a *p*-value is $0.000 < 0.01$. Similar results have been discovered to demonstrate that the adoption of ICT plays a critical role in organizational performance, providing cooperatives with a one-sided advantage in their daily tasks (e.g., Bayo-Moriones et al., 2013).

In the test of hypothesis 2 (H2), the beta coefficient is 0.45, the standard error is 0.048, the value $t = 9.425 > 2$ and the value $p = 0.000 < 0.01$. So H2 is supported. This finding is consistent with a recent study which contends that ICT has a positive impact on employee commitment if and only if it is used effectively (e.g., Sarayani et al., 2014; Naser and Sajad, 2016). This entails centralizing information and effectively disseminating information to the appropriate person, at the appropriate location, and at the appropriate time.

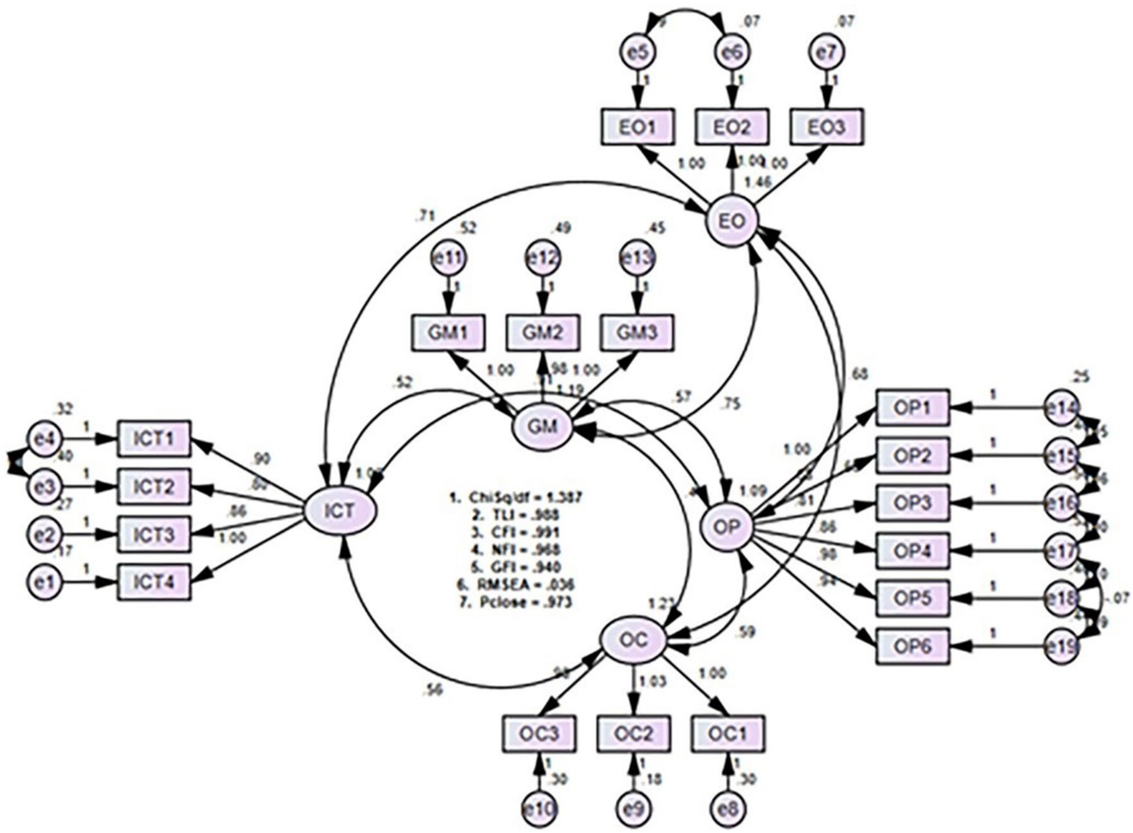

FIGURE 2 | Confirmatory factor analysis.

TABLE 3 | Path coefficients and hypothesis tests.

Hypotheses	Relationships	Beta	Mean	*SD*	*t*-value	*p*-value	Result
H1	ICT ->OP	0.667	0.666	0.049	13.669	0.000	Supported
H2	ICT ->OC	0.453	0.454	0.048	9.425	0.000	Supported
H3	ICT ->GM	0.424	0.425	0.046	9.175	0.000	Supported
H4	ICT ->EO	0.542	0.542	0.039	13.890	0.000	Supported
H5	EO ->OP	0.032	0.032	0.048	0.677	0.498	Non-supported
H6	GM ->OP	0.113	0.117	0.049	2.299	0.022	Supported
H7	OC ->OP	0.121	0.121	0.054	2.232	0.026	Supported
Standardized direct, indirect, and total effects of the hypothesized model							
H8	ICT ->OC ->OP	0.055	0.055	0.025	2.226	0.026	Supported
H9	ICT ->GM ->OP	0.048	0.050	0.022	2.198	0.028	Supported
H10	ICT ->EO ->OP	0.017	0.018	0.026	0.666	0.506	Non-supported

According to the findings of this study, ICT has a positive impact on the GM of employees, which supports hypothesis 3 (H3). The results show that the beta coefficient is 0.42, the standard error is 0.046, the t-value is $9.175 > 2$, and the p-value is $0.000 < 0.05$.

Hypothesis 4 (H4) is justified because the beta coefficient is 0.54, the standard error is 0.039, the t value is $13.890 > 2$, and the p value is $0.0000 < 0.01$. Similar results were found by the previous study which added that technology sets the outer limits of what can be imagined in terms of new ways of optimizing operations and developing new products and services.

As for hypothesis 5 (H5), the results of the study show the beta coefficient 0.032, standard error 0.048, t-value 0.6772. p-value is $0.498 > 0.05$ that is recognized as an index quantifying the strength of the evidence against the null hypothesis. So, the hypothesis is not confirmed based on the results.

The results of the study show that a significant impact of GM on OP with the beta coefficient 0.113, standard error 0.049, t-value $2.299 > 2$ and p-value is $0.022 < 0.05$. Therefore, hypothesis 6 (H6) is supported, and the result echoes previous studies examining the effect of mindset on organization performance (Zingoni and Corey, 2017).

For hypothesis 7 (H7), the results are significant and confirmed by the values of the positive beta coefficient 0.121, standard error 0.054, t-value $2.232 > 2$, and p-value is $0.026 < 0.05$. These findings are consistent with those of previous studies.

This study used the Smartpls 3.27 software's bootstrap method to compare the three mediating effects mentioned above (the size of one was set at 5,000 cases to illuminate the path coefficients and their significance, and the interval confidence level was set at 95 percent; Jung et al., 2019). Mediation being described as process through which the independent variable is likely to influence the dependent variable (Baron and Kenny, 1986), we can see through the full representation of structural model evaluations, as well as population mediation statistics, in **Figure 2**, and **Table 3** that the independent variable is responsible for triggering the action of these 3 mediators or their intensity, which itself influences the response (dependent variable). Precisely, it entails showing the relevance of indirect effects *via* mediating factors using a model of analysis execution.

If the indirect effects are not statistically significant, we conclude that no mediating effect exists (Agler and De Boeck, 2017). We used a test procedure to test the hypothesis of mediating effects (Preacher and Hayes, 2004). The mediating effect assumes that the indirect effect is significant and that the confidence interval does not contain zero. The mediating effects of GM and OC assume a positive and meaningful relationship with ICT and PO integration. **Table 2** shows that OC ($p = 0.026$) and GM ($p = 0.028$) both positively and significantly mediate ICT–OP link. As a result, H8 and H9 are all supported, which is consistent with previous studies (e.g., Glaeser, 2016; Nagy et al., 2016).

The results of the study of ICT on OP by the mediation of EO are not significant and are invalidated by the values of the positive coefficient 0.017, the standard deviation 0.026, the t-value 0.6662. Furthermore, p-value (0.506) is greater than the threshold of 0.05, which shows insignificance. This indicates strong support for the null hypothesis. As a result, H10 is not supported.

DISCUSSION AND CONCLUSION

The purpose of this study was to shed light on the inconsistent findings of previous studies on the ICT-performance link by considering the supplement of human resource attributes, such as organizational commitment, growth mindset, and entrepreneurship orientation. These variables are known to function as fundamental components of an organization, as they are closely associated with a variety of organizational outcomes (Meyer and Allen, 1991; Caniëls et al., 2018). We proposed that the high level of organizational commitment, growth mindset, and entrepreneurial orientation catalyzed by ICT can improve organizational performance in a crisis context.

Using SEM to conduct an analysis of the mediation model, this study provides empirical evidence that ICT adoption has positive impact on OP of agricultural cooperatives amid pandemic. Based on the findings, we discovered that ICT adoption contributes to OP with the complement of appropriate human resource attributes. Specifically, OC and GM serve as intermediation factors in the relationship between the ICT and the OP, but EO neither has impact on OP nor mediates the ICT-OP relationship. This could be due to various factors specific to agricultural cooperatives and is consistent with the results of previous research which showed that companies with a stronger EO posture often have poorer results (Wales et al., 2011).

Our study differs from previous research in that it combines mediating factors that explain why and when ICT can improve OP. The sections that follow discuss the study's theoretical and practical implications.

Theoretical Implications

This paper has the potential to make a significant contribution to the ICT literature for two reasons. First, the study combines macro- and micro-approaches to examine the impact of ICT adoption on organizational performance. The macro-approach emphasizes external factors (e.g., ICT and OP), while the micro-approach highlights internal factors (e.g., human attributes) to explain how ICT influences organizational performance both directly and indirectly. The results obtained by coupling the variables OC, GM, and EO enrich the literature on the value of ICT. Several related works have focused on the relationship between ICT and external stakeholders, with little attention paid to the micro-level aspect, more specifically internal stakeholders, which is the focus of this study.

Second, this study specifically demonstrated that ICT adoption, acting as a critical catalyst, has a significant impact on the behavioral and positive cognitive processes of the employees with regard to their organization. Specifically, ICT adoption leads to a positive growth mindset and organizational commitment, which ultimately increases the organizational performance. It shows that complementarities between ICT adoption and human resources have a positive influence on the growth of businesses. As a result, this study demonstrates the application of the complementarity theory in organizations.

Practical Implications

The current study has practical and meaningful implications for organization leaders. First, leaders and senior management teams that intend to integrate ICT into their operations during the pandemic must view their employees as important agents who can improve performance. Most importantly, leaders should recognize that employees' reactions in the form of various perceptions, attitudes, and behaviors toward their organization play a critical role in creating organizational performance. As a result, leaders should attempt to efficiently communicate and interact with their employees *via* ICT. Furthermore, they must provide adequate rewards for employees in order to maximize active participation through them. By communicating with ICT on a regular basis, the leadership team can foster an ICT-driven culture within the organization.

Second, we propose that senior management teams pay more than special attention to their employees' behavioral indicators, which remain critical to the performance of their organization. Given the importance of the organization's communication processes in influencing the effects of performance both directly and indirectly, it is critical for organizations to maintain and improve employee perceptions and attitudes. Based on our findings, we propose that senior leadership teams must understand and accept that the level of commitment and a common mental pattern, such as a employees' growth mindset, serve as a practical indicator of whether ICT can have a positive impact on performance.

LIMITATIONS AND FUTURE RESEARCH

The following research limitations should be solved in order to favorably contribute to future studies. First, the way employees adopt ICT might be influenced by cultural variations between organizations in poor and industrialized countries. Western cultures are more likely to emphasize the relevance of ICTs in their environments; therefore, their employees may be more receptive to using them for assignments. Because we collected data from Ivorian agricultural cooperative employees, careful interpretation of the results is required when they are applied in the context of different cultural environments (Arnold et al., 2007). Despite the fact that ICT is universal, employees of Ivorian may have reacted differently to ICT use than employees of Western, Eastern Asian. As a result, other studies on the ICT–OP link should account for these cultural differences.

Second, we were unable to include objective indices for measuring ICT. Although previous ICT adoption studies have suggested that subjective measures, such as employee perceptions, may more accurately reflect actual phenomena of performance than objective measures of ICT adoption, we recommend that future work includes both subjective and objective measures of ICT adoption in the research model (Saengchaia et al., 2019).

Third, this paper did not adequately address the potential endogenous problem and its solutions. Endogenous issues are caused by a variety of unobservable factors. For example, ICT, OC, GM, and EO are likely to be heavily influenced by unobservable factors such as skills, business age, business ownership, culture, reputation, and visibility (Ugwu and Ugwu, 2017). Future research should investigate and adequately address this issue.

Fourth, this paper only looked at the roles of OC, GM, and EO as mediators in explaining the ICT–OP nexus. However, it is important to note that a variety of important micro-level variables (for example, motivation, corporate social responsibility, collaboration, trust, participation, and psychological well-being) are likely to act as intermediators to translate the positive influence of ICT on organizational performance. This issue should be addressed in greater depth in future studies.

Fifth, we were unable to fully investigate the significant impact of organizational cultures on employee perceptions of ICT adoption. Organizational cultures such as effectiveness, customer orientation, control, approachability, and management philosophy can all have a significant impact on the level of ICT adoption and employee perceptions of ICT. As a result, future research should investigate the role of organizational cultures in explaining the impact of ICT adoption.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

Conceptualization and software were contributed by ZL. Data curation and formal analysis were contributed by GA. Methodology was contributed by UA. Writing—original draft was contributed by ZL and GA. Writing—review and editing was contributed by UA and OA. All authors contributed to the article and approved the submitted version.

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Does Polychronicity Undermine Procrastination Behavior Through ICTs? Insights From Multi-Level Modeling

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Information and communication technologies (ICTs) are widely used in developing nations as a dynamic solution for socio-economic development. Pakistan has seen a rapid increase in the use of ICTs during the previous decade. The purpose of this study is to examine how polychronicity affects procrastination behavior when it is influenced by ICTs. According to this study, individuals are described as a dynamic and destructive kind of self-regulation failure in ICTs. Procrastination is a behavior that prevents emerging economies from growing from developing countries. We researched the group-level polychronicity influence of the individual behavior and the mechanism of procrastination from a team-level perspective of worker behavior. This study data collected 231 workers from 76 groups working in ICTs in Pakistan. The results revealed that the group polychronicity and the behavior of group members were positively linked by taking the work overload as a mediator. Moreover, group cohesiveness moderates the role between polychronicity and work overload diminishing the mediation procession between-group polychronicity and individual procrastination. The practical importance of this study is to understand the causes of procrastination, and how to decrease this obstacle to a fairer workplace. It also helps to decide the professional route that is most suited to personality characteristics.

Keywords: multitasking, ICTs, team cohesiveness, procrastination behavior, role overload

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INTRODUCTION

The world's information and communication technologies (ICTs) are continually developing (Kandemir, 2014), and letting the technology-use abilities of an individual erode may affect the personal, professional, and social life of that individual (Reinecke et al., 2018). Individuals engage in consecutive or multiple activities at the same time, moving their time between producing and ingesting action by their incomes and social positions (Carrier et al., 2009). However, with the advances in ICTs, the ability to conduct several activities concurrently has increased in the current organizational culture.

Many scholars have increased their focus on the impact of multitasking, which explains why people engage in multiple activities sequentially (Dux et al., 2009; Grawitch and Barber, 2013). Aral et al. (2007) describe the terminology used in research studies, including the terms polychronicity, time use preference, task switching, multitasking skills, instantaneous actions, intersecting activities, simultaneous activities, and at the same time tasks. According to Aral et al. (2012), multitasking is mainly done for two reasons: (a) to do tasks more efficiently and (b) to make primary activities more satisfying. They believe that the previous shows the time constraints, whereas the latter increases the benefit gained from main tasks (Junco, 2012). The type of multitasking activity depends on the primary task, and the secondary time uses of travel are the subject of this study (Spink et al., 2002; Ozmutlu et al., 2003).

Individuals have developed new behaviors due to the creation of new ICTs, such as multitasking behavior is described as performing numerous tasks simultaneously (Spink and Park, 2005; Peng and Kamil, 2018). For the last two decades, academic researchers have examined multitasking when at least one of the activities involves ICTs (Lay and Schouwenburg, 1993; Spink et al., 2002; Ozmutlu et al., 2003). The activities may be contemporaneous, indicating simultaneous exposure and action (e.g., driving while listening to the radio), or they may involve frequent motor and attentional switching (e.g., checking a phone while reading a book; Kamble et al., 2014). Multitasking with ICTs is particularly prevalent in societies with a high level of ICTs access and ownership (Zhijie et al., 2019b). These countries, which are generally described as "modern industrial," "contemporary," and "highly prosperous," also have a larger proportion of older people in their demographics and aging rates (Asghar et al., 2020). Procrastination is the action of laying off what we know we should do. At times, our prevention techniques may be rather inventive (He, 2017). Procrastination is best defined as the action of postponing a task that was initially scheduled despite anticipating to be worse off as a result of the delay (Pachler et al., 2018). All conceptualizations of procrastination behavior acknowledge the necessity of postponing, delaying, or deferring a job or choice, consistent with the Latin roots of the term, pro meaning "forth, out, or in favor of" and ante meaning "of tomorrow" (Emerson, 2015; Rebetez et al., 2016). Procrastination is also defined as the deliberate postponement or avoidance of a planned or scheduled job without justification (Reinecke et al., 2018).

Teams differ in the level of cohesiveness (Tziner and Vardi, 1983). The cohesiveness of a team refers to how individuals are drawn to and motivated to stay on the team (Wendt et al., 2009). Team cohesiveness occurs when team members believe their team will assist them in achieving their need for affiliation or status and achieving a common goal (Shin and Park, 2009; Matt Graham and Jones, 2019). As a result, sociologists have classified team cohesiveness into two categories: socio-emotional cohesiveness and instrumental cohesiveness (Bozanta et al., 2016). Socio-emotional cohesion is a sense of belonging that develops when individuals experience emotional fulfillment due to team participation. Instrumental cohesion is a sense of belonging that develops when team members are mutually reliant on one another and believe they could not accomplish the goals of the team working separately (Bozanta et al., 2016; Matt Graham and Jones, 2019).

Although multitasking behaviors of ICTs have been extensively studied at the individual level (Aral et al., 2007), few studies have examined multitasking behaviors of ICTs in groups or teams (Aral et al., 2012). To our knowledge, this is the first study to examine the impact of team multitasking behavior on team member's procrastination behavior (Rebetez et al., 2016). How multitasking activity, which regularly increases work burden, is absorbed into everyday routines of employees whose mental capabilities begin to deteriorate (Carrier et al., 2009). Furthermore, ICTs researchers have confronted the difficulty of developing adequate methodologies for examining complicated patterns of ICTs usage during group-level multitasking (Bozanta et al., 2016). Self-reporting methods are most suitable in such populations due to the increased likelihood of intellectual bias and the rising disintegration of ICTs usage, which is difficult to monitor and recall in a questionnaire (Kleinman, 2010). As a result, it is critical to establish proper methodologies for examining ICTs patterns in this group-level multitasking. These approaches must generate high-quality data and be acceptable to team-level study participants (Colom et al., 2010; Asghar et al., 2018).

In this study, we evaluate the effects of team-level multitasking behavior on procrastination of individual members, with work overload and team cohesiveness acting as mediators and moderators, respectively, in ICTs companies in Pakistan. Participants in this study expressed their opinions and impressions regarding multitasking activities, stating which ones they would be most comfortable with. Our findings illuminate the role of traditional and new ICTs software house employees, most of whom were socioeconomic and cultural members. These findings can be used to inform the development and implementation of future research strategies aimed at reducing employee procrastination. In addition, the current study establishes a foundation for creating methodological recommendations for assessing complicated multitasking behaviors among employees of ICT software houses in Pakistan.

Considering the "double-edged sword effect" of multitasking trends and the possible impact of contextual factors on employee behavior (Mattarelli et al., 2015), the multitasking trend of teams of employees may affect their procrastination behaviors (Singleton, 2019; Kokoç, 2021). However, there is less evidence of research that has been done to link multitasking trends to procrastination. The multitasking trend of the team indicates that the group expects its members to perform multiple tasks simultaneously while also switching between these tasks (Grawitch and Barber, 2013). The single trend reveals that the team wants employees to focus on a particular task and complete each task in order. This feature influences many individual behaviors as an aspect of group culture (Robinson and Kalafatis, 2017). However, few studies have correlated the time characteristics of such teams with procrastination. Therefore, it is indispensable to study procrastination behavior from the perspective of team-level multitasking (Korabik et al., 2017).

LITERATURE REVIEW AND HYPOTHESIS

Multitasking and Procrastination Behavior

Information and communication technology is a condensation that indicates "Information and Technology of Communication" (Spink et al., 2002). ICT is an inclusive word that refers to all technological advancements that enable the control and transmission of all digital information (Ozmutlu et al., 2003). ICTs encompass all fields of computerized development that exist today to assist individuals, businesses, and organizations. It is tough to represent ICTs since they move at such a quick pace. It is a concern for limiting, recovering, controlling, and transmitting computerized information (Spink and Park, 2005). The ICTs may be defined as the processing and communication agencies and highlights that support instructing, learning, and the breadth of organizational activities in various ways (Dux et al., 2009).

As part of restoration efforts in the IT sector, it is necessary to increase the quality of human resources. One of the important restorations is to train the interns to become persistent workers. The requirement to prepare the IT sector to become long-term employees is critical because the world is currently characterized by vulnerability and rapid change (Aral et al., 2012). Under such cases, a person capable of developing into a permanent employee will learn to adapt to fragility and rapid change (Kandemir, 2014). It is undeniable that social networking and ICTs for organizational reform are being effectively used by practitioners and researchers today as rings of globalization. A social network is a member of the ICTs family in a variety of ways, most notably in terms of its use for academic purposes, communication, and other facets of human endeavor (Aral et al., 2007; Dux et al., 2009).

When given the type of service of social networking and ICTs in media technology, the two concepts are closely tied (Aral et al., 2012). This is especially true when considering the role of each in the area of communication and networking about organizational structure, which may entail the prediction of employee procrastination (Zhijie et al., 2019a). Let us examine the difficulties associated with each. Social networking enables users to exchange ideas, digital photographs and videos, postings, and notify others about online or real-world activities and events (Gull et al., 2021). The online enables people to connect with others who reside in various areas, from inside a city to across the globe. Members may be able to message any other member, depending on the social networking platform (Košíková et al., 2020). In some other cases, members can contact anybody with whom they have a connection, and then anyone with whom they share a connection, and so on (Zhijie et al., 2021).

Information and communication technologies are frequently used to connect audiovisual, telephone, and communications systems *via* a unified infrastructure or connection system (Xiaolong et al., 2021). There are significant economic incentives to integrate the telephone and computer networks into a single unified system of cabling, signal delivery, and administration (Aral et al., 2007; Zhijie et al., 2019a). ICT is an umbrella word that refers to any kind of communication, including radio, television, mobile phones, computer and network hardware, and satellite systems, as well as the numerous services and appliances that accompany them, such as video conferencing and distance learning (Tkiouat et al., 2021; Xiaolong et al., 2021). As a result, it is obvious that social networking is an essential element of ICTs, and that ICTs plays a role in delivering excellent humanistic services, including educational services at various levels, which may help forecast the procrastination of source employee (Chen et al., 2021; Toyama and Hayashi, 2021). Employees who spend excessive time on nonorganizational ICT activities run the danger of procrastinating, resulting in poor performance despite the organizational benefits of ICTs (le Roux et al., 2021).

Procrastination is the action of delaying the least important activities in exchange for more urgent tasks (Svartdal and Steel, 2017) or doing more enjoyable things in substitute of less important things, therefore procrastinating imminent tasks (Gupta et al., 2012). To be classed as procrastination, the conduct must be counterproductive, unnecessary, and delayed. Similarly, it voluntarily postpones a chosen course of action despite anticipating a negative outcome (Rebetez et al., 2014). The application of procrastination to the field of education qualifies members as procrastinators, a term that refers to actions that are delayed (Rebetez et al., 2016). While there is no commonly accepted definition, individual procrastination could be stated as the procrastination of organizational objectives to the point that optimal performance becomes very improbable, resulting in psychological suffering (Mohammed and Nadkarni, 2014; Li et al., 2017).

Robinson and Kalafatis (2017) have continued work for understanding the increased attention to the concept of multitasking. Therefore, certain temporal characteristics at the group level multitasking may affect the procrastination behaviors of employees, including the trend of team multitasking (Rebetez et al., 2016). The multitasking tendency of the team is that the team level supervises to perform multiple task preferences simultaneously, which represents the common cognition of team members (Bluedorn et al., 1999; O'Loughlin, 2016). On the other hand, Rebetez et al. (2016) found that individuals would adjust the task progress status through their existing resources and push the task toward the expected. But for individuals who need to participate in multiple tasks at the same time, their remaining time resources are less, their self-regulation ability is limited, and they cannot effectively adjust the task progress (Ahmad and Saud, 2016; Rebetez et al., 2016). Therefore, it may cause the task to fail to be complete successfully. Asghar et al. (2018) have found that individuals who participate in multiple tasks simultaneously have low time consciousness, which may also cause individuals to postpone completing the planned task. According to the theory of resource conservation, focusing on the group and individual resources gives a precise framework for understanding the effect of emotion and performance assessment. The first priority of humans, according to the conservation of resource (COR) theory, is to build, defend, and foster additional resources in order to protect social relationships, which in turn protect self (Alvaro et al., 2010). Based on theory, a model is offered that helps in engaging in proper behavior by preventing resource loss, gaining new resources, and maintaining existing ones (Hobfoll, 2011). Based on the above analysis, this study proposes the following hypothesis:

H1: The team level polychronicity is a positive effect on the member procrastination behavior.

Multitasking and Members Work Overload

The workload is a term that relates to the complexity of systems of work that employees should complete (Bolino and Turnley, 2005). This study concentrates on quantitative stress since it has garnered extensive attention in the restoration domain (DeArmond et al., 2014). In this perspective, we regard workload as a source of job stress that is likely to affect task detachment negatively. Matthews et al. (2014) stated that individuals with a strong workload or high expectations might work more from the household. Furthermore, they may predict a big schedule at work, which may make disengagement more challenging (Paden and Stell, 1997; Wan et al., 2014). Moreover, a heavy workload or a greater amount of expectations may be associated with increased types of depression activation, making it more difficult to unwind and forget about work (Dux et al., 2009). Strong empirical evidence suggests that increased effort is associated with high procrastination (van Eerde, 2016).

According to the stressor paradigm, detachment of task is most likely related to procrastination. Our primary indicator of strain in this study is procrastination (Dukes et al., 2013). There is relatively limited research available that task detachment is correlated with greater fatigue and with other measures of employees procrastination behavior (Gupta et al., 2012). For example, discovered a negative correlation between even detachment and future weariness. Asghar et al. (2020) showed moderately high unfavorable associations between detachment and psychosomatic problems and between increased procrastinating.

Moreover, the multitasking trend of the team represents the work requirements of the team on the members, but this trend does not increase the working time of the members. Therefore, as the multitasking trend of the team increases, the work requirements of the team for members gradually exceed the working hours of employees, and members have demanding perceptions, namely, the role of work overload. According to the viewpoint of COR theory, the fewer the resources, the greater the fear of losing them (Alvaro et al., 2010). On the contrary, those who already have a huge amount of resources, are likely to acquire more. The loss of resources at the initial stage can have a negative impact on individuals and groups, demoralizing them. Even those with plenty of resources might be discouraged by ongoing resource loss, no matter how resilient they are (Hobfoll, 2012; Holmgrenn et al., 2017). To perform multiple tasks simultaneously, the time resources they have are also consumed and preserve resources. Therefore, they reduced their efforts, thereby delaying the completion of the original plan (O'Loughlin, 2016). In addition, task switching between different tasks has also sped up the perception of resource consumption, especially the conversion between different types of tasks (Stead et al., 2010). Therefore, as the multitasking trend goes down, the individual feels that the role is overloaded. To find a psychological balance, the effort on the goal may be reduced, and procrastination may occur (Holmgrenn et al., 2017). Ahmad and Saud (2016) have discovered that engaging in multiple tasks has changed the perception of the workload of an individual and then cause some negative effects.

H2: Work overload as a mediating role in the relationship between team multitasking trends of individuals and member procrastination behavior.

The Moderating Role of Team Cohesiveness

Conservation resource theory also stated that individuals are trying to alleviate the perception of resource loss by reallocating time resources (Hobfoll, 2001). Alvaro et al. (2010) explain COR theory that social support is extremely important. People who have fewer resources at their disposal are more likely to feel burden and stress. People can contact a friend or family member, in this case, to obtain enough resources to ease the stressful work environment. This reallocation of time resources can be reflected in the arrangement of working hours, that is, work cohesiveness (Hobfoll, 2012). A group consists of two or more people who share common interests' objectives, and it through (Hobfoll, 2011). The majority of persons belong to groupings that can be categorized in a kind of circumstances. Groups can be classed in a variety of ways. For instance, they can be classified as friendship groups or task groups. Informally, a friendship group forms to meet the needs of members for security, esteem, and belongingness (Langfred, 1998; Brockman and Morgan, 2006). A friendship network among coworkers may develop over time.

In addition, electronic enhancements are being made to friendship groups. MySpace, Facebook, Twitter, Blogger, YouTube, and instant messaging are all examples of technological tools used to create and maintain friendship networks (Aral et al., 2007). Leaders form task groups to fulfill specific organizational objectives. A single group may serve both companionship and task functions (Dux et al., 2009). Several variables affect team cohesiveness, including member interaction, team size, stringent admission requirements, team success, and external competition and difficulties. Cohesiveness typically increases with the amount of time team members spend together. Team cohesion is maximized when teams are kept small enough to execute the duties yet large enough to collaborate (Li et al., 2017). When teams have a rigorous admissions process, they tend to be more cohesive. Cohesiveness increases in direct proportion to the success of the team. When members encounter external competition or a difficult goal, team cohesiveness tends to strengthen (Holmgrenn et al., 2017). Matt Graham and Jones (2019) have suggested that carrying out multiple tasks at the same time may produce positive results and may also lead to negative results, and it is critical to identify the time conditions during which they act.

Thus far, we have emphasized the importance of cohesion as a good characteristic. It is possible members of highly group cohesive are more engaged in activities of their team, are absent less frequently, have a low turnover rate (Wendt et al., 2009), meet a variety of individual needs, including emotional and social identity needs, and are occasionally exceptionally productive (Garg et al., 2018). While cohesive teams are beneficial to their members, they may or may not be beneficial to the organization as a whole (Peng and Kamil, 2018). Liu et al. (2019) have been revealed that the failure of this adjustment will increase the resource consumption of an individual and increase the role of overload. Zhijie et al. (2019a) have believed that employees who need to perform multiple tasks simultaneously desire an environment where they can freely arrange working hours. Team cohesiveness fosters a high degree of motivation and dedication to the team, which results in increased team performance (Matthews et al., 2014). Therefore, it can be inferred that there is a difference in the impact of team multitasking on the role of overload (Yile, 2020; Gull et al., 2021). For employees working in a team cohesiveness environment, team multitasking tends to affect role overload. Positive effects are mitigated for employees working in a less autonomous environment. Hence, we propose the hypothesis.

H3: Team level cohesiveness is a moderating role and weakens the relationship between team multitasking trends and work overload.

Based on the H2 and H3 hypotheses mentioned above, this study proposes that the mediation effect of work overload is controlled by team cohesiveness. Precisely, when individuals work in teams with high cohesiveness, they can flexibly determine working hours and working methods, freely redistribute available time resources, balance the relationship between work requirements and individual time resources, and reduce multitasking trends to overload character roles (O'Loughlin, 2016). As a result, the efforts of employees to reduce resources for resource conservation purposes will also decrease, and the frequency of procrastination will decrease. Moreover, when individuals work in a team with a high level of cohesiveness, they can only obey the workflow in the team, and it is difficult to redistribute time resources flexibly (Kokoç, 2021). This limitation has instead exacerbated the imbalance between work requirements and individual time resources. Furthermore, intelligence enhances the perception of character overload. Therefore, employees are more likely to threaten resource consumption and are more likely to reduce their efforts to the goal to seek psychological balance for resource conservation, increasing the frequency of procrastination, based on this, this article proposes hypotheses.

METHODOLOGY

Data Collection and Sample Source

This study employed a cross-sectional design and a quantitative methodology, as data were acquired *via* questionnaires. This questionnaire was distributed by hand and was coded to identify people who worked in the same workgroup. ICTs employees report the questionnaire items based on their observations, and they have been informed that the content of the questionnaire is completely secret. It was exclusively used for scientific research purposes to ensure that respondents could react confidently. The sample consisted of 28 ICT enterprises in Punjab, Pakistan. A total of 254 employees representing 88 work teams participated in the survey. After excluding three groups with invalid questions, a total of 231 valid questionnaires were obtained, encompassing 76 members of working teams in 27 ICTs industries. All factors were quantified using a predeveloped scale. Men accounted for 51.1% of all valid samples improved, while women accounted for 48.9%; the average age is 30 years; education level is primarily concentrated at the bachelor's degree level and above, and the average working life in this type of organization is 2 years.

Measurement Scale

The scales of measurement utilized in this investigation are already developed. To avoid confusion during the formal survey, the questionnaire entries have been modified to ensure the reliability and validity of the questionnaire. The multitasking tendencies of the team were quantified using an eight-item scale (Bluedorn et al., 1999). In this study, the internal consistency coefficient is set to 0.909. The procrastinating behavior was assessed using an 11-item pure procrastination scale developed by researchers (Svartdal and Steel, 2017). In this investigation, the internal consistency coefficient is 0.896. The work overload scale is composed of three items. In this study, the four-item scale used to assess team cohesiveness has an internal consistency coefficient of 0.840. All items were rated on a five-point Likert scale and demographic variables, such as age, gender, and education were included.

Analysis and Results

The statistical software, Mplus, was used to do cross-layer linear regression analysis on the data. First, while multitasking and team cohesiveness are group-level variables, the assessments of this study are based on individual-level accounts. As a result, a pooling test and the combining method were used to show that the mean value of the formative evaluation was employed as the observation value of the group. Specifically, (1) the intraclass correlation (ICC) of the multitasking tendency of the team is 0.38, (2) the ICC of the cohesiveness of the team is 0.31, the ICC (2) of the cohesiveness of the team is 0.57, and the rw_g mean is 0.71; all of these values satisfy the proposition of convergence, indicating that the average value of the multitasking tendency of the team and team cohesiveness at the individual level can be used as the observation value of the group. Second, typical single-level linear regression does not provide adequate explanations. Single-level regression models that do not distinguish between within-group and between-group variation may produce problematic findings (Muthén and Muthén, 2017). The primary analysis method in this study was a multilayer linear model. The distinctions within the grouping strengthen the reliability of conclusions drawn from the distinctions between groups. Finally, this study was corrected utilizing cross-layer regression analysis by the recommendations. According to, the Monte Carlo Bootstrapping test was included

TABLE 1 | Different validity analysis of variables.

Model	Factors	χ^2	Df	$\Delta\chi^2/\Delta_{df}$	CFI	TLI	RMSE	SRMAR
Model 1	4 factors	436.064	278		0.94	0.93	0.068	0.062
Model 2	3 factors	9109.945	258	137.44**	0.87	0.84	0.083	0.081
Model 3	2 factors	1428.883	276	246.70**	0.69	0.56	0.142	0.171
Model 4	1 factor	2010.836	272	224.25**	0.48	0.44	0.162	0.162

***Indicates that 0.01 level of significance and *Means 0.05 levels of significance.*

TABLE 2 | Correlation analysis of variables.

Variable	Mean	SD	1	2	3	4	5	6	7	8
Gender	1.87	0.401	1							
Age	29.98	2.891	0.023	1						
Educations	2.01	2.713	0.028	−0.019	1					
Experiences	1.97	1.017	0.019	0.324**	−0.004*	1				
Multitasking	2.78	1.787	−0.021	−0.106*	0.051*	−0.031*	1			
Work overload	1.68	2.104	−0.104	−0.132*	0.020*	−0.023*	0.480**	1		
Team cohesiveness	2.38	1.00	0.036	−0.032*	0.051	−0.006*	0.303*	−0.037*	1	
Procrastination behavior	3.71	0.837	0.052	−0.089*	−0.041*	−0.048*	0.410**	0.417**	−0.221**	1

***0.01 level is significantly related.*
**0.05 levels are significantly correlated.*

during the mediating effect in this section to ensure the validity of the conclusions.

DATA ANALYSIS AND RESULTS

Common Method Bias

The questionnaires were distributed and improved only one time in this study, and questionnaires were filled by the survey respondents separately, which may be affected by homogeneous variance. The results of one-way test show that the variance of the first factor is 31.553%. Therefore, it can be considered that the data used in this study does not have serious common method deviation problems and have certain reliability.

Confirmatory factor analysis (CFA) can be used to ascertain the distinct validity of variables. The four factors models used in this article include four factors, three factors, two factors, and other combinations, and each factor is subjected to CFA separately. The results of several models are shown in **Table 1**. Among all, the four-factor model (Model 1) had the best fit. Thus, if the terms correspond to four variables and the variables have appropriate discriminant validity for further regression analysis, the challenges associated with measuring variables can be evaluated.

As shown in **Table 2**, the correlations of the variables involved in this study are listed. Multitasking trend perception, the role of overload, and procrastination behavior all exist significant positive correlation, which is consistent with the research hypothesis. However, its interaction and strength need to be verified by subsequent analyses.

This study uses a multilayer linear regression model for hypothesis testing. First, the main effect of mediating work overload and procrastination behavior acts as a zero-model test for the dependent variable procrastination behavior. The results show that, without adding any variables, the persistent behavior of the intergroup difference is 0.249 ($p < 0.01$); the variance between groups for the role of work overload is 0.496 ($p < 0.01$). This shows that procrastination behavior and work overload are adequate differences between groups that can be tested by subsequent cross-layer regression (**Table 3**).

First, Model 2 and Model 4 show that there are many teams whose substantial tasks tend to predict the work overload at the individual level positively ($\gamma = 0.608$, $p < 0.01$) and procrastination behavior ($\gamma = 0.350$, $p < 0.01$), Hypothesis 1 is significant. Second, Model 5 shows that the role of the individual level is addressed according to the mean value ($\gamma = 0.383$, $p < 0.01$) and group-level roles, the mean values of the loaded groups ($\gamma = 0.416$, $p < 0.01$) are all significant. Forward-looking procrastination behavior, but the team is multitasking positively predicting the trend ($\gamma = 0.098$, $p > 0.05$), is no longer significant. It is contingent work overloaded to the full mediation effect H2 supported; Hypothesis 2 is significant. Finally, Model 2 states that team multitasking tends to explain role overload, 11% variance between groups; Model 4 states that team multitasking tends to explain procrastination, 81% between-group variance; Model 5 states that work overload is explained at the individual-level delayed behavior, 21.71% of the variance within the group,

TABLE 3 | Direct and indirect effects.

Dependent variable	Work overload		Procrastination behavior		
	Step 1	Step 2	Step 3	Step 4	Step 5
Level - 1					
Work overload					0.410**
Level- 2					
Multitasking		0.598**		0.420*	0.097
Work overload					0.396**
σ^2	0.577	0.576	0.683	0.445	0.398
τ_{00}	0.631**	0.503**	0.241**	0.336**	0.206**
$R^2_{\ level-1}$					22.01%
$R^2_{\ level-1}$		23.88%		14.98%	27.96%

***0.01 level is significantly related.*
**0.05 levels are significant.*

TABLE 4 | Moderating effect of team cohesiveness.

Dependent variable	Work of overload		Procrastination behavior	
	Step 6	Step 7	Step 8	Step 9
Level - 1				
Work overload				0.382**
Level - 2				
Multitasking	0.633**	0.674**	0.420**	0.198
Team cohesiveness	−0.189	−0.152	−0.266**	−0.216*
Cross-level interaction		−0.467*	−0.349**	−0.190
Multitasking × Team cohesiveness				0.330*
σ^2	0.676	0.676	o.585	0.485
τ_{00}	0.388**	0.350**	0.185**	0.147**
$R^2_{\ level-1}$				17.09%
$R^2_{\ level-1}$		9.79%		20.54%

***0.01 level is significantly related.*
**0.05 levels are significant.*

mean work overload at the group-level explained procrastination, 28.16% variance between groups.

Table 4 shows the moderating effect of team cohesiveness, compared with Model 6, and team multitasking trend and team cohesiveness interaction, the term has a significant negative impact on role overload ($\gamma = -0.467$, $p < 0.05$), and this interactive term explains role overload with 9.79% between groups as poor. In order to show the regulation effect instinctively, the regulation effect diagram shown in **Figure 1** is drawn from a multitasking scenario when team time cohesiveness is low.

Multitasking trends have stronger effects on work overload, and when team cohesiveness is higher, team multitasking tends to have less effect on work overload H3 is proved. To verify the use of mediation effect, we performed a Monte Carlo test, and the test results showed that within 90% CI, indirectly, the impact was significantly negatively measured [90% CI (−0.473, −0.02)], accordingly, Hypothesis 4 is supported.

DISCUSSION AND CONCLUSIONS

The purpose of this study was to examine the influence of ICT-encouraged multitasking on procrastinating behavior of Pakistan members. Moreover, multitasking with ICTs is encouraged among team members. Nevertheless, multitasking is not necessarily detrimental to cognitive performance and may even be beneficial. Procrastination is an individual behavior with time characteristics, and the multitasking tendency reflects the preferences of the team on time usage and has certain time characteristics (Kokoç, 2021). Group team orientation can influence many studies that have confirmed the behavior of

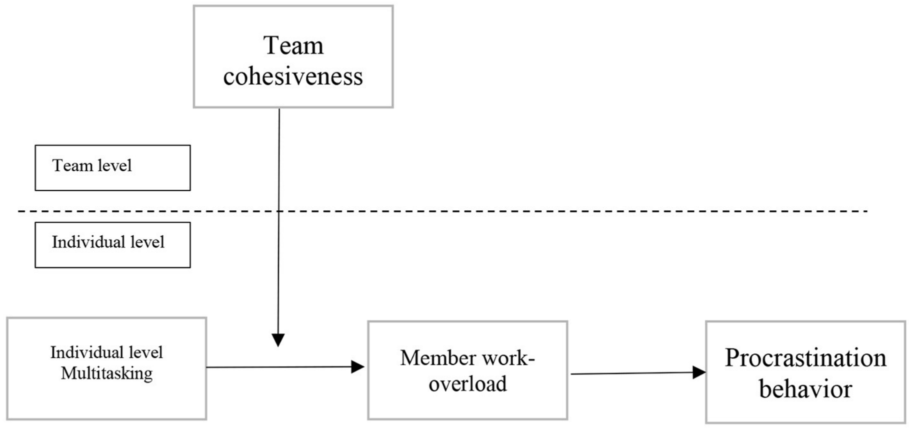

FIGURE 1 | Multilevel modeling.

individual employees. Therefore, in this study, the multitasking trend of the team and individual delays in connecting, emphasize the concern of time-related constructs and fill a gap in the field of multitasking trends affecting delayed behavior.

This study extends the research on the time use preferences of the team to the realm of individual behavior ICT industry's in Pakistan. This study discovered work overload as a mediating role in the relationship between group-level polychronicity and member procrastination behavior. In addition, the moderating role of team cohesiveness and group-level polychronicity and member workload. With scholars focusing their attention on the properties of time in recent years, the theory of resource conservation has increasingly been applied to this field (Holmgrenn et al., 2017).

In this study, group-level multitasking increases the work overload of employees, which will cause members procrastination behavior that time resources are fast rapid consumption, there is a huge threat. Therefore, a stressful situation occurs when there is a threat of resource loss, actual resource loss, or the failure to obtain resources despite investment and people spend their resources to avoid potential resource loss (Park et al., 2018). This study reveals multitasking of team simultaneously throwing light on the mechanism of individual procrastination. The scope of application of resource conservation theory has been extended to the field of organizational psychology.

Finally, this study finds the moderating role of team cohesiveness and improves the role of team multitasking trends on individual procrastination. Team cohesiveness is an important boundary condition to alleviate the negative effects of job requirements. The conservation resources theory states that individuals can redistribute time and resources. The COR theory states that individuals have an inborn quality that is activated during stress to recover lost resources. The basic principle of COR theory is that people tend to maintain, gain, protect, and foster what they value the most. Resources are the things that people value the most because resources are useful in achieving desired outcomes (Hobfoll et al., 2018). The source is to alleviate the sense of resource consumption. The premise of this redistribution is cohesiveness, and team cohesiveness, as a change, better reflects the true state of cohesiveness measurements, but very few studies focus on it. In response to the call to focus on team cohesiveness, this study treats team cohesiveness as a group level, the moderator variables have been included in the study model. It was found that team cohesiveness can reduce the role of overload caused by the multitasking tendency of the team, further debilitating the entire process of "team multitasking tendency perception through work overload and thus procrastination behavior." The results make up for previous research the lack of attention to the cohesiveness regulation role of the team has enriched the boundary conditions of the multitasking tendency of the team to influence the role and helps to understand how to develop better and play the positive role of the multitasking trends of the team (**Figure 2**).

Practical Implications

Current research on team multitasking and ICTs has examined the members' workload and the relationship between group-level polychronicity and procrastination behavior at the individual level in this study. Several factors affect efficiency during group-level multitasking in ICTs, including the amount of time spent communicating, the number of communication events, interruptions, overlapping communications, the communication channel chosen, and the communication goal. According to others, team-level multitasking has little influence on the analytical ability or work overload of individuals as they focus on numerous jobs. Others doubt the feasibility of multitasking, i.e., functioning on multiple activities concurrently. While training in multitasking *via* ICTs or group-level multitasking has been shown to improve executive attention, neuroimaging studies have shown that the effects of training on executive attention are manifested in the tuning of the brain areas involved in the network and also in improved connectivity

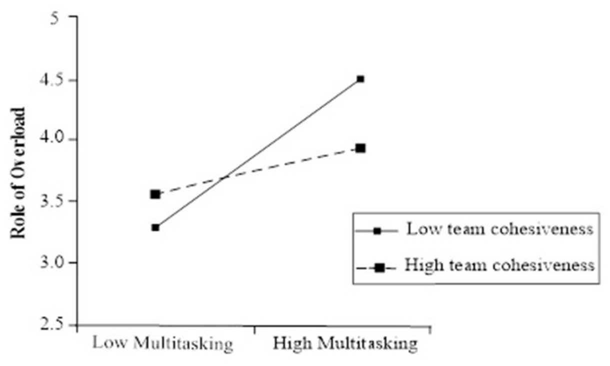

FIGURE 2 | Team cohesiveness.

between areas *via* axon expansion and myelination. Interestingly, persons who prefer to engage in group-level multitasking do not appear to be particularly adept at task-switching or attention tasks, even when they are confident about their ability to perform these tasks successfully. This study found that group-level multitasking provides them enjoyment. Multitasking was positively correlated with the emotional satisfaction of University students, albeit at the cost of cognitive performance. Multitasking is necessary for certain professions and is an indisputable phenomenon in education and life. Multitasking can be an efficient use of time, a relatively manageable endeavor when required, or, when well-monitored or well-regulated, an effective tool in problem-solving. Furthermore, people, who are hyperconnected, in general report that they do not have problems attending to everyday tasks and interpersonal relationships.

The conclusion of this research has a certain guiding value for management daily. First, group-level multitasking may be a factor in the delayed behavior. While multitasking may have numerous benefits for a company, it may also work against its objectives. Managers should be acutely conscious of the tendency toward the "double-edged sword" effect of multitasking. One cause for the procrastination behavior of an individual is that he/she attempts to engage in various projects and distributes his/her time resources, resulting in a lack of resources required to accomplish the task and time wasted when the assignment was changed. As a result, the team of an organization cannot pursue additional tasks blindly in a short period.

When an organization and team leader care about the employees, they can reduce their role overload. The multitasking tendency perception of an individual will increase the level of procrastination. Therefore, how to relieve the work overload of an employee is a crucial problem. Managers in an organization can empower, provide support, set a reasonable workload, and other ways to balance the relationship between work requirements and work resources of employees. Mutual support between colleagues is also one of the ways to reduce the overload of an employee. By relieving the work overload, procrastination can be avoided.

Team cohesiveness better reflects the true situation of cohesion than individual coherency, and it is also closer to the institutional arrangements within the organization. Team cohesiveness can effectively alleviate team members' character's sense of work overload reduces procrastination. Therefore, an enterprise should fully authorize the team to exercise discretion when formulating a management system and workflow. The measures reduce rigid team workload and arrangements and allow employees to truly feel the real existence of cohesiveness, so that team members can improve their time control ability, and by reallocating time resources to balance the relationship between work requirements and work resources, reduce negative behavior. Multitasking at the group level is thought to be a component of ICT in terms of their services to software houses. We cannot underestimate the importance of social networks and ICT in today's globalization, particularly in the IT field of endeavor, but there is a need to provide a policy that assists in regulating the affairs by IT professionals and other stakeholders to reduce the level of procrastination among members; members engaged in social networking for purposes other than mental procrastination. Therefore, it is beneficial if the organization and team leader establish policies for workload reduction and performance enhancement.

Limitations and Future Study

The limitations of this study are mainly as follows: First, this is based on cross-sectional data during the research. Future research will be done on longitudinal data and interview-based studies. This study-based questionnaire filled by individual employees may exist in the same source. This method creates a common basis in research. In the future, we will try to use multisource and multipoint measurement methods to reduce homogeneous method bias. We are performing more rigorous statistical tests, which may be another limitation.

Second, although this study found the mediating role of work overload and the moderating role of team cohesiveness, the mechanisms and boundary conditions under other theories cannot be ruled out. Future research considers introducing other mechanisms to enrich the multitasking trend and delay the mechanism of the relationship and boundary conditions. Finally, procrastination is a common outcome variable in the field of psychology. In the field of management, but considering the limitations of the questionnaire survey method, in future research, we can use experimental methods commonly used in psychology to develop, explore, and realize the integration of interdisciplinary research.

DATA AVAILABILITY STATEMENT

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the School of Business and Tourism Management, Yunnan University, Kunming, China.

ETHICS STATEMENT

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

NG and MA: conceptualization, methodology, investigation, resources, and data collection. ZA and NG: software and validation. ZA and MA: formal analysis, writing, and original draft preparation. MA: writing, review, and editing. TX: funding. All authors contributed to the article and approved the submitted version.

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Unethical Leadership and Employee Extra-Role Behavior in Information Technology Sector: A Moderated Mediation Analysis

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During the COVID-19 pandemic, enterprises were obliged to employ social media and digital tools to complete ordinary work. The pandemic has created a series of complexities and challenges, which have hampered harmonic contact between leaders and followers. The indirect relationship between unethical leadership and extra-role behavior (EXB) *via* psychological empowerment (PYE) is investigated in this study. We also look into the role of perceived organizational support (POS) as a moderator in the link between unethical leadership and PYE, as well as the indirect link between unethical leadership and EXB. Data were obtained from 258 supervisor–employee dyads from various small- and mid-sized information technology (IT) enterprises using time lag data. Unethical leadership has an impact on employee psychological empowerment as well as EXB. The findings of this study indicated that POS also mitigated the negative consequences of unethical leadership on employee psychological empowerment. Similarly, the role of psychological empowerment as a mediator in the link between unethical leadership and employee EXB is influenced by POS. This study will also benefit researchers and practitioners interested in human resource practices in the IT industry.

Keywords: extra-role behavior, COVID-19, unethical leadership, psychological empowerment, perceived social support

INTRODUCTION

Management is compelled to develop strategically adaptable enterprises in response to more competitive marketplaces. Fortunately, a new wave of information and telecommunications technologies has set the basis for previously unthinkable new organizational forms (Khan et al., 2020a). The COVID 19 pandemic has forced enterprises to adopt digital working patterns, and the difficult and complicated nature of digital work is raising ethical challenges in the workplace (Weberg and Fuller, 2019). Extra-role behavior (EXB) can also improve an organization's efficiency and effectiveness by transforming organizational resources, reforming resources, and adapting to changing situations (Labrague, 2020; Khan et al., 2020b). In previous studies on the information technology (IT) sector, EXB by IT company employees has been given a lot of weight. Employee behavior has been found to have a direct impact on their willingness and desire to learn, thereby boosting the institution's status and distinguishing it from the competitors (Vigoda-Gadot, 2007; Khan et al., 2020c). Extra role play might be advantageous to the enterprise because the IT sector is a spontaneous and humanistic profession that requires working with and managing a variety of technological facilities (Belogolovsky and Somech, 2010). Leaders who do not encourage EXB are more likely to have lower employee achievement and effectiveness (Srivastava, 2017; Khan and Khan, 2021).

Despite the fact that the antecedents of EXB have attracted little empirical attention, scholars have claimed that leadership behaviors play a role in supporting or inhibiting employee performance (Khan, 2021). Cortina (2008) argued that employees expect leaders to pick up on clues about what constitutes appropriate EXB since they set the tone for the entire enterprise. Previous research has shown that leaders' behaviors have a significant impact (Behery et al., 2012). There has been a growing trend in leadership literature to address the dark and peculiar negative aspects of leadership behavior, as well as their impact on followers (Khoo and Burch, 2008). Unfortunately, unethical behavior by leaders has spread to all types of organizations, both public and private (Mathieu et al., 2014). An increasing number of leadership and management studies are focusing on the negative aspects of leadership, such as disruptive leadership (Goldman, 2009; Bhandarker and Rai, 2019), abusive leaders (Tepper, 2000), and tyrannical leaders (Allio, 2007). Leader behaviors or acts that are illegal or contradict current moral standards are referred to as unethical leadership (Brown and Mitchell, 2010).

Leadership research may aid in the investigation of a leader's dark side in order to determine its impact on organizations as a result of potential behavioral deviations in employee work performance (Khoo and Burch, 2008). Unethical leaders tries to please senior managers and earn personal favor, but they overlook subordinates' vital EXB, harming the environment, human resources, and organizational culture in the process (Boddy and Croft, 2016). Similarly, Gan et al. (2019) asserted that unethical leadership jeopardizes individuals' psychological well-being and that as a result, unethical leadership undermines organizational success.

The purpose of the study is to learn more about how unethical leaders affect employees' EXB in the IT industry. EXB is vital to remember in the Chinese context since most Chinese workers have a high power distance orientation, which suppresses the EXB of employees who are focused on work-related matters (Liu et al., 2010; Zhang et al., 2011). Extra-role behaviors are defined as those that benefit or intend to benefit the company and are directly linked to the role and expectations. In the workplace, this is referred regarded as organizational citizenship behaviors (Zhu, 2013). The extra-role of workers supports industry-related behavior. Employees' EXB has been linked to positive outcomes (like personal job performance and organizational effectiveness; Ng and Feldman, 2012; Frazier and Bowler, 2015). Given the potential benefits of EXB, researchers focused on the antecedents of EXB that support optimal practices.

To further understand why unethical leadership is linked to EXB, this study investigated the mediating effect of psychological empowerment (PYE) or the assumption that showing unethical leadership will negatively affect employee EXB. Although studies have linked unethical leadership with work behaviors using job satisfaction, strain, and commitment (Weberg and Fuller, 2019), such mediating mechanisms cannot completely explain the effect of toxic leadership on EXB. Extra-role voice behavior, unlike other forms of employee behavior that promote cooperation, can produce organizational disruption and high individual costs for performers, making employees apprehensive of engaging in it (Turnley and Feldman, 1999).

According to Turnley and Feldman (1999), the key to fostering EXB is to influence employees' expectations of empowerment, which are not reflected by strain, happiness, or dedication. Employees who are at ease with interpersonally hostile acts are more likely to engage in constructive behavior (Valentine and Edmondson, 2014). The PYE paradigm is easily relevant to unethical leadership effects on extra-role activities as a result of such an affect-laden cognitive perspective (Van Dyne and LePine, 1998; Khan et al., 2021). Furthermore, the unethical leadership paradigm suggests that employees might use a shield to protect themselves from the negative impacts of unethical leadership; as a result, unethical leadership does not affect all employees equally (Ferris et al., 2002). We question if unethical leadership has a synchronized influence on psychological empowerment and EXB for which employees. Employees who become victims of unethical leadership activities may benefit from perceived organizational support (POS). Employee perceptions of how much the organization values their contribution and cares about their well-being are referred to as POS (Eisenberger et al., 1986). According to a previous study, POS has a significant impact on employee performance and well-being. POS can mitigate the negative effects of unethical leadership on psychological empowerment and EXB (Eisenberger et al., 1990). We aimed to provide a moderated mediation model that takes into account why unethical leadership is associated with EXB by looking at the intervening role of psychological empowerment, as well as how the relationship proceeds by looking at the POS boundary condition (see **Figure 1**).

THEORY AND HYPOTHESIS

Unethical Leadership, Psychological Empowerment, and EXB

Unethical leader behavior is currently receiving a lot of attention in the media and in the business literature because of the prevalence of many types of unethical behavior in the workplace as a result of leaders' corruption or failure to follow moral norms (Gan et al., 2019). Unethical leadership has an impact on employee psychological outcomes, and employee psychological empowerment helps employees cope with the negative consequences of unethical behavior (Kalshoven et al., 2016). Because workers in highly unethical organizations are unable to get crucial indicators for understanding behaviors and prospective outcomes, the behavior–outcome relationship tends to be a "black box" defined by incompatibility (Khan et al., 2020d).

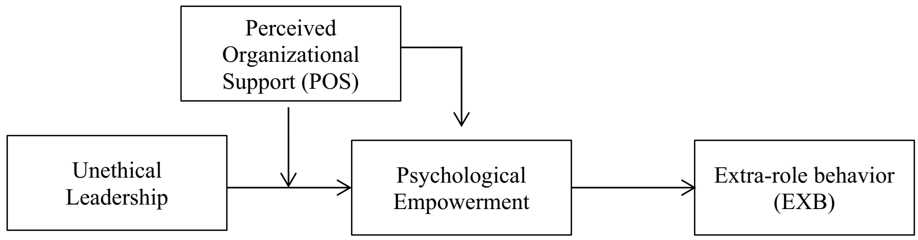

FIGURE 1 | Research Model.

Employees are less likely to notice useful cues that could aid them in deciphering the intricacies. Employees disregard their ability to predict future outcomes, viewing the situation as a negative and unmanageable threat (Weberg and Fuller, 2019). When confronted with this difficulty, employees may see extra-role performance as dangerous. According to one study, having limited access to corporate culture information increases sensitivity and defensiveness (Edmondson, 1999). Several studies have indicated that ethical leadership promotes psychological empowerment (Dust et al., 2018; Suifan et al., 2020). According to a meta-analytic review, unethical leadership induces psychological stress (Matos et al., 2018). Thus, we assume that:

H1: Unethical leadership has a negative impact on psychological empowerment.

Psychological Empowerment as a Mediator

Psychological empowerment has been shown to be a powerful motivator that can improve employees' work engagement and extra-role performance (Ugwu et al., 2014; Bano et al., 2019). Psychological empowerment has also been shown to have a beneficial impact on job satisfaction (Amundsen and Martinsen, 2015) and is a strong predictor of work engagement (Dewettinck and Van Ameijde, 2011). According to social exchange theory, the nature of the individual–organization association has a profound influence on human behavior (Blau, 1964). When employees believe their workplaces are psychologically safe, they are more likely to see their association with the employer as a relational rather than an economic one, reciprocating by expressing voluntary tasks in the organization. This indicates a constructive association between psychological empowerment and employee behavior related to performing extra-role. To better understand the dynamics of unethical leadership impact, researchers have long proposed that the unethical leadership–outcome nexus be analyzed in its entirety, including mediating effects (Khan et al., 2020e). Therefore, we examine the mediating role of psychological empowerment in advancing a system that connects unethical leadership and EXB. Employees must consider organizational climate features when determining whether or not to partake in employee behavior (Tangirala and Ramanujam, 2008).

People who work in extremely hazardous environments are more likely to dwell on the negative and uncontrollable aspects of a crisis (Ferris et al., 2002), and they have even less psychological empowerment. Thus, in a less psychologically safe business environment, people are more likely to engage in activities relating to resource conservation and strict regulation systems, which are linked to activity limitation and revealed in the status quo (Staw et al., 1981). Employees who have psychological empowerment as a result of an unethical work environment, on the other hand, are less likely to challenge the organization because insufficient psychological empowerment is a concern for them (Webster et al., 2016). Hence, unethical leadership becomes a significant impediment to IT industry staff using psychological empowerment to express their experiences and other voluntary actions at work. The evidence for psychological empowerment mediating effect has been increasing. For example, psychological empowerment was established to mediate the effects of change-oriented leadership (Detert and Burris, 2007) and ethical leadership (Walumbwa and Schaubroeck, 2009) on follower EXB. Several researchers have focused on positive leadership, but none have looked at the effect of an unethical workplace environment on psychological empowerment and employee EXB in the IT industry field. Unethical leadership could be the most potentially applicable construct for relating an unethical work atmosphere to decreased psychological empowerment and EXB. Hence, we propose:

H2: Psychological empowerment mediates the association between unethical leadership and EXB.

Moderating Influence of POS

Organizational Support Theory argues that individuals tend to personify their organization by considering it as a personality with either good or malignant intents toward them (Eisenberger et al., 1986, 1990). The positive effects of POS on outcomes that benefit both individuals and enterprises are explained by two basic factors. On the one hand, the Social Exchange Theory (Blau, 1964), based on the reciprocity norm (Gouldner, 1960), proposes that employees who feel supported by their organization will pay back their obligation and repay the firm's caring.

We propose that POS can act as a buffer against the negative effects of unethical leadership. Companies can increase workers' views of authority while also lowering the negative impacts of confusion that come with unethical leadership (Miller et al., 2008; Khan et al., 2020f). Employees' perceptions of organizational support might help them recognize decision rules and retain additional resources, reducing the ambiguity that comes with challenging situations (Li et al., 2014). Employee morale and EXB are lowered to a minimum as a result of unethical leadership (Wang et al., 2015). Organizations use rewards to communicate to specific employees that they have received organizational support, which helps to foster workforce identification (Li et al., 2014). People who believe their organization is on their side are more likely to trust authorities and take control over their surroundings (Khan and Khan, 2019; Khan et al., 2020g). By establishing a strong relationship with the organization as a shield (Stamper and Masterson, 2002), which acts as a shield by defending employees' higher EXB interests, the organization will gain more employee support in adverse situations. Research backs up the premise that social support and confidence in coworkers buffer the detrimental impacts of unethical leadership on job outcomes (Vigoda-Gadot and Talmud, 2010). To summarize, when individuals identify as organizational support receivers, they are less likely to perceive unethical leadership as a less threat, reducing the negative impact of unethical leadership on psychological empowerment and EXB. Thus, this study proposes:

> *H3*: POS moderates the negative association between unethical leadership and psychological empowerment in this way that high POS weakens rather than strengthens this association.

The aforementioned statements are part of a larger context in which psychological empowerment mediates both unethical leadership and psychological empowerment, as well as unethical leadership and EXB, and POS moderates both unethical leadership and psychological empowerment. POS may potentially moderate the efficacy of the mediating mechanism for psychological empowerment in the association between unethical leadership and EXB – a moderated mediation model (Edwards and Lambert, 2007). Organizational support is more likely to provide proper knowledge and social reinforcement, which can lead to psychological empowerment and, ultimately, EXB, so POS is critical for lowering the indirect effect of unethical leadership on EXB through psychological empowerment. Thus, we suppose as:

> *H4*: The mediating impact of psychological empowerment on the unethical leadership EXB association is moderated by POS, with the mediating effect lower when POS is high rather than low.

MATERIALS AND METHODS

Sample and Procedures

We gathered data from supervisor–employee dyads from several small- and mid-sized IT enterprises in China's Anhui and Jiangsu provinces for this study. Employee EXB is important in IT enterprises because they want their employees to create voluntary interests in order to accomplish extra tasks that help enhance quality and service processes (Turnley and Feldman, 1999). The most significant feature of this study is that data were collected in two-time waves employing a time lag approach. In a time-lag survey, data were collected at multiple intervals, reducing the possibility of common method biases (Podsakoff et al., 2003) while simultaneously giving respondents ample time to observe and respond to the questionnaire (Detert and Burris, 2007). We developed an online and offline survey questionnaire in English, which was subsequently translated into Chinese using a process called translation back-translation (Brislin, 1980). Student volunteers were engaged to collect data through social media and email. In addition, offline survey questionnaires were mailed to the Human Resource Departments of the respective IT enterprises. As part of the data gathering procedure, 206 randomly selected employees were given online and offline surveys and asked to nominate their immediate superiors. The survey was designed using a five-point Likert scale ranging from 1 to 5, with 1 indicating strongly disagree and 5 indicating strongly agree. In the first wave, we requested permission from 412 matched employees and their immediate managers to participate in the survey, and we received 312 responses. Employees provided demographic data as well as information on unethical leadership and POS. In the second wave, psychological empowerment data were collected from employees, while employee EXB data were collected from immediate supervisors. Some questionnaires were incomplete or incorrectly rated, and these were excluded from the final sample for analysis. Thus, there were a total of 258 final responses received. **Table 1** shows the demographics of the respondents.

Measurement Scale

The unethical leadership scale was developed by Pitesa and Thau (2013) and used by Gan et al. (2019). Employees were asked to rate their degree of agreement on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Sample item included: "*My supervisor never discussed confidential company information with an unauthorized person*." To assess POS, we used the scale developed by Eisenberger et al. (1986). The response options ranged from 1 to 5, with 1 representing "strongly disagree" and 5 representing "strongly agree." A sample item was "*organization really cares about my well-being*." To assess psychological empowerment, we used a scale developed by Spreitzer (1995). The response options ranged from 1 to 5, with 1 "strongly disagree" and 5 "strongly agree." A sample item was "*I can decide on my own how to go about doing my work*." We used a five items measurement scale of EXB adapted by Bettencourt and Brown (1997). Sample item includes "*This employee helps customers with problems beyond what is expected or required*." All of the items were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Data Analysis

To ensure the validity of the proposed study variables, we used AMOS version 24.0 for CFA testing in this study (see **Table 2**).

TABLE 1 | Demographics.

Variables	N	Percentage
Gender		
Female	109	42.25
Male	149	57.75
Age		
Up to 24 years	103	39.92
25–30 years	94	36.43
31–35 years	37	14.34
36–40 years	11	02.84
Above 40 years	13	03.55
Qualification		
Undergraduate	48	18.60
Graduate	122	47.29
Masters/PhD	88	34.11
Experience		
Up to 05 years	102	39.53
6–10 years	106	41.09
11–15 years	32	12.40
Above 16 years	18	06.98

N = 258.

TABLE 2 | Correlation matrix.

	EXB	POS	Unethical leadership	Psychological empowerment
EXB				
POS	0.43**	1		
Unethical leadership	−0.38**	−0.15**	1	
Psychological empowerment	0.37**	0.18**	−0.45**	1

***p < 0.01; *p < 0.05 (two-tailed).*

TABLE 3 | Results of confirmatory factor analyses.

Models	χ^2	df	TLI	CFI	RMSEA
Four factors model	658.965	392	0.984	0.982	0.043
Three factors model UL, and PYE combined	863.291	402	0.961	0.963	0.067
Two factors model UL, POS, and PYE combined	1,098.112	413	0.956	0.962	0.068
Single factor model	1,129.824	417	0.957	0.957	0.069

UL, unethical leadership; PYE, psychological empowerment; POS, perceived organizational support; TLI, tucker-lewis index; CFI, comparative fit index; and RMSEA, root-mean-square error of approximation.

The items in each construct with the highest and lowest factor loads are merged first, followed by the items with the highest and lowest factor loads, and finally, all items are assigned to one of the indicators depending on the factor analysis results. In this study, four variables were used to assess the CFA model: unethical leadership, employee psychological empowerment, POS, and employee EXB. In this study, the tucker-lewis index (TLI), comparative fit index (CFI), and root-mean-square error of approximation (RMSEA) tests were used to evaluate model fit. The model fit was found to be satisfactory: $\chi^2 = 658.965$; df = 392; CFI = 0.982, TLI = 0.984; RMSEA = 0.043 (see **Table 3**).

After validating convergent validity, the data show that all variables loading have a significant impact on latent constructs. The discriminant validity of the four proposed constructs was then examined using several models on the four-factor model used in the study. The results of the fit index imply that the data better fit the impact of the four-factor model (see **Table 2**). As a result, the study's key constructs' outcomes are more distinct and inclusive of the findings. Based on the findings, four constructs were analyzed further.

RESULTS

Using hierarchical multiple regression analysis, the hypotheses provided in this study were tested. Hypothesis H1 expected a link between unethical leadership and psychological empowerment among employees. Employee psychological empowerment was found to be significantly negatively related to unethical leadership ($r = -0.41$, $p = 001$), supporting H1 (see **Table 4**).

The current study used Baron and Kenny (1986) approach to evaluate mediating effects. Four conditions must be met for this approach to consider the mediation effect. to investigate mediating effects. First, there should be a significant relationship between independent variables and mediators. Second, there should be a significant link between the independent and dependent variables. Third, there should be a significant link between the mediator and the dependent variable. Fourth, the independent and dependent variables should have an insignificant link in the presence of a mediator.

Table 3 shows a significant relationship between unethical leadership and psychological empowerment ($r = -41$, $p = 001$), showing that the first criterion was met. The results (see **Table 3**) showed a significant link between unethical leadership and employee EXB ($r = -0.21$, $p = 0.01$), demonstrating that the second condition is satisfied. Similarly, the results (**Table 3**) indicate a significant relationship between psychological empowerment and EXB ($r = 0.31$, $p = 001$), which meets the third condition. Furthermore, the findings of the study (see **Table 3**) show that in the presence of psychological empowerment, the link between unethical leadership and Employee EXB is not significant ($r = -0.06$, ns), indicating that the fourth condition is satisfied. Employee psychological empowerment was found to play a significant role in moderating the link between unethical leadership and employee EXB, indicating that H2 was supported.

According to H3, POS is expected to moderate the link between unethical leadership and psychological empowerment.

TABLE 4 | Mediating role of PYE and moderating role of POS.

Predictors	Dependent variable					
	Psychological empowerment			EXB		
	M1	M2	M3	M4	M5	M6
Unethical leadership	−0.41***	−0.39***	−0.32***	−0.21***		−0.06
Perceived organizational support		0.30*	0.34*			
POS × UL			0.21**			
Psychological empowerment					0.31***	0.28***
R^2	0.32***	0.33***	0.34**	0.06**	0.10***	0.11***
ΔR^2	0.32***	0.01*	0.01**	0.06**	0.11***	0.06***
F	38.11***	4.48*	11.75**	4.70**	9.90***	26.13***

$^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$.

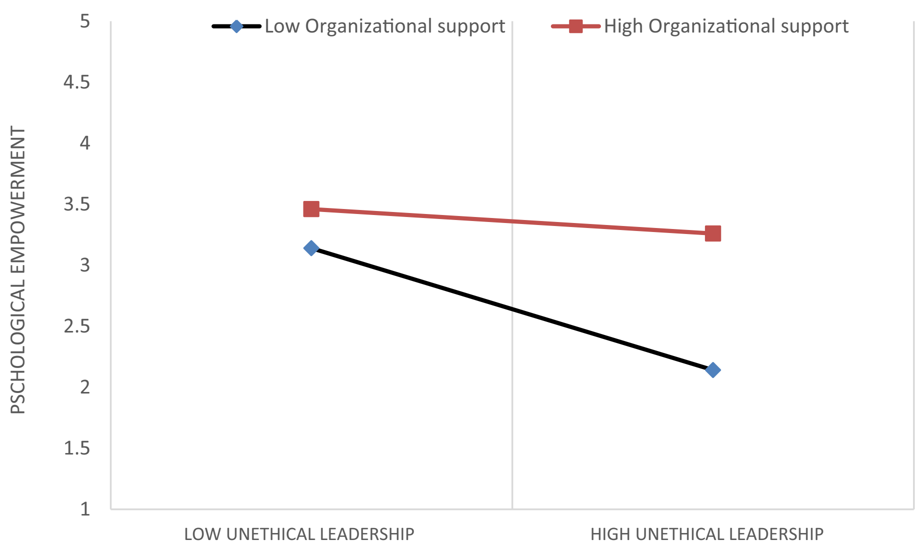

FIGURE 2 | Moderating role of perceived organizational support in the relationship between unethical leadership and psychological empowerment.

TABLE 5 | Bootstrap results for conditional indirect effects psychological empowerment.

Perceived organizational support	Boot indirect effects	Boot PYE	Boot lower limit 95% CI	Boot upper limit 95% CI
−1 SD	−0.17	0.03	−0.26	−0.12
Mean	−0.11	0.02	−0.20	−0.11
+1 SD	−0.09	0.03	−0.18	−0.05

CI, confidence interval; Bootstrap sample size = 5000.

H3 was supported by the finding that the interaction between unethical leadership and POS was significantly linked with psychological empowerment ($r = 0.21$, $p = 01$).

Aiken and West (1991) approach was used to map the interactive effect of POS to evaluate if it had a moderating effect (Aiken and West, 1991). **Figure 2** depicts interaction patterns that are consistent with H3 predictions. There was a negative correlation between unethical leadership and psychological empowerment when the POS was low ($r = -0.31$, $p = 001$), but when the POS was strong ($r = 0.40$, $p = 001$), the association became significant and positive ($r = 0.40$, $p = 001$).

Preacher et al. (2007) constructed a process macro that ran a bootstrapping test to determine the indirect impacts of mediation on different levels of moderators. Because it uses bootstrapping to moderate the normality of the mediation effect distribution, the CI is distinguished from other conventional methods (Preacher et al., 2007). The bootstrapping method evaluates the effect of the generated data set by replacing the original data set with an observational estimate of the numbers. The direct effect of the predictor on the independent variables is obtained using this method. It also has an indirect impact on the outcome variable, which is passed through to the mediator (psychological empowerment; MacKinnon et al., 2004). The 95 percent CIs for indirect effects *via* POS were created using Process Model 7 and 5,000 bootstrapping samples.

Table 5 shows the CIs for the bootstrapping test on three POS values: one SD below the mean, one SD for the mean, and one SD above the mean. If there are values between the low and high CIs that are not zero, the CIs are statistically significant (Hayes, 2013). **Table 5** illustrates the bootstrapping CIs for indirect psychological empowerment influence, with POS values ranging from one SD above mean (−0.18 to −0.05), mean (−0.20 to −0.11), and one SD below mean (−0.26 to −0.12). There is a significant indirect mediation effect of unethical leadership on employee EXB *via* psychological empowerment because this does not include zero. Under the conditions of one SD above, mean, and one SD below, it can find a significant moderated mediation effect. Thus, the H4 was supported.

DISCUSSION

Despite the fact that unethical behavior in corporate culture is a widespread occurrence (Brown and Mitchell, 2010), and most firms understand the relevance of extra-role practices, leadership abuse is considered as a barrier to any society's and organization's growth and development. Extra-role behavior is becoming increasingly crucial in the IT business to address the difficulties of digital safety and harmonic online contact between IT employees (Pitafi et al., 2020). However, there are significant gaps in the literature regarding unethical leadership and employee psychological and behavioral outcomes in small- and mid-sized IT enterprises that must be addressed.

It is commonly considered that an unethical work environment may negatively affect employee behavior and diminish employee desires to engage in additional activities that are beneficial to the organization (Tangirala and Ramanujam, 2008). There is a paucity of research linking unethical leadership to employee extra-role actions and behavior, as well as studies examining the boundary conditions of unethical leadership's effects in the context of the IT industry. This study proposed four hypotheses to analyze the effects of unethical leadership on employee EXB. This finding is in line with previous research, which has shown that ethical leadership has a positive effect on psychological empowerment. As a result, unethical leadership might have a negative impact on psychological empowerment. This study also found that psychological empowerment has a significant mediation influence on the link between unethical leadership and employee EXB, which is in line with previous studies (Dust et al., 2018).

Furthermore, the POS impact was found to have significant in moderated mediation analysis, which is consistent with previous studies (DeConinck, 2010; Khan et al., 2021). Our four hypotheses were all supported in the end. Prior studies in a different field have found consistent outcomes, specifically in the context of ethical leadership. However, this article addresses a gap in the research by proving a link between unethical leadership and employee behavior as well as investigating the boundary conditions of unethical leadership's consequences, notably in the IT sector. I' is also consistent with previous practice (Detert and Burris, 2007) to combine mediators and moderators into a single model.

Theoretical Implications

On a theoretical level, this research contributes to a new understanding in the area of the influence of unethical leadership on employee psychological empowerment and employee EXB in the IT industry. First, the findings support the view that psychological empowerment and EXB are more than just a tool for LMX, job happiness, and positive affectivity, although there is a substantial correlation between psychological empowerment and these three control variables. In the context of a sample collected from China, our proposed study framework was supported. The impact of unethical leadership on employee psychological and behavioral consequences is explored in our model. The findings supported the model's validity and usefulness in determining the impact of unethical leadership on employee behavior using a moderated mediation model. Employees and leaders in the IT sector participated in this study, and their responses were recorded at various time intervals. The findings add to our knowledge of the factors that influence employee EXB. Several previous studies have backed up our findings, indicating that leadership, as well as psychological and organizational mechanisms, can influence employee extra-role actions and behaviors (Khan et al., 2019, 2020e).

Second, the moderating effects lead to a more nuanced picture of how unethical leadership–psychological empowerment–EXB is affected by POS. We predicted that organizational support buffers the negative effects of unethical leadership. As a result, employees who are supported by their employers are more likely to have interpretative experiences that will guide their future behavior. Employees with POS, on the other hand, are more likely to have a high level of psychological empowerment and to perform extra-role in a highly unethical leadership than non-POS employees. This is one of the first studies in the IT industry to employ the psychological empowerment approach to describe the link between unethical leadership and EXB.

Third, we sought to contribute to research strategy to test by identifying psychological empowerment as a mediator (cognitive mechanism) in the relationship between unethical leadership and EXB. We looked at the surprising effect of psychological empowerment in predicting employee EXB, which has been established as a key psychological variable. Our model better explains how unethical leadership affects employee EXB, as well as who is most affected by unethical leadership in terms of psychological empowerment and EXB, by combining mediation and moderation. Our findings not only back up and explain assertions that the IT industry has a strong link to employee EXB, but they also provide ways to mitigate the harmful consequences of unethical leadership. Finally, in the context of China, this study adds to academics' understanding of the impact of unethical leadership on employee psychological (psychological empowerment) and behavioral outcomes (EXB). The majority of previous research looked at a related research framework in the setting of western countries.

Managerial Implications

This study provides several managerial implications that can assist executives, managers, and policymakers in reducing the negative consequences of unethical leadership. First, the outcomes of this study will benefit the IT industry by allowing us to better understand the factors that influence EXB. Workers' EXB is crucial in making this field environmentally and socially acceptable. IT industries are environmentally concerned. Extra-role performance, according to our findings, is a psychological phenomenon that is influenced by situational factors (e.g., unethical leadership, POS) *via* psychological empowerment. According to the findings of this study, the first step in avoiding unethical leadership behavior can be performed. Second, individuals' reactions to an unethical organizational atmosphere are influenced by their prior experiences; therefore, enterprises may need to foster a specific environment, consistent procedures, and success in order to promote extra-role activities (Ferris et al., 2002). Employees react to unethical leadership based on their own experiences; thus, organizational leaders and executives should impose ethical norms and standards (Lapalme et al., 2009). Employees may be motivated to perform extra-role activities to increase organizational performance if they work in an ethically comfortable environment with regular procedures and a formal complaint system.

Third, unethical leadership practices can be reduced by managers and immediate supervisors engaging in psychological counseling and mentoring. It is suggested that the IT industry organizes mentorship and training sessions to alleviate stress and psychological pressure on managers. Finally, the IT industry should develop a recruitment strategy that requires all selected applicants to be reviewed on an ethical and good character basis before being considered for managerial positions. In the recruitment process, people with strong ethical values and proactive personality attributes should be given priority. Finally, according to the findings of this study, psychological empowerment and POS are significant predictors and influences of extra-role activities among employees. IT enterprises should take corrective action to encourage psychological empowerment and POS amid unethical leadership. Increased POS has been shown to improve psychological empowerment at higher levels, reducing the negative association between unethical leadership and psychological empowerment. Leadership approaches (such as change-oriented leadership and ethical leadership) have been shown to improve psychological empowerment at higher levels (Detert and Burris, 2007).

Limitations and Future Research

This study, like all others, has several limitations that should be considered before interpreting the findings. First, the data for this study came from different sources (including leaders and employees) and different time periods; therefore, there is no serious issue of common method bias. The findings of larger firms may differ from ours because the data were acquired from small- and mid-sized IT enterprises. Second, demographics such as gender, education, experience, age, and occupation were included as control variables in this study. Future research can look into the effect of demographics in better understanding the link between unethical leadership and employee EXB. Third, because our findings are based on data obtained just from IT firms in two Chinese provinces, the findings of this study cannot be generalized to other industries or geographical locations. Findings from research undertaken in other regions of the world may differ from ours.

Third, a broad employee EXB measure was used in this study. Employee EXB has been related in a variety of ways, both favorably and adversely, to unethical leadership and psychological empowerment. According to Liang et al. (2012), Psychological empowerment is positively related to both positive and negative EXB temporal variation to the same degree, dispelling concerns that it affects positive and negative EXB differently. More research into the impact of unethical leadership on all aspects of EXB is needed in the future.

Finally, this study used POS and psychological empowerment as a moderator and mediator in the context of a sample obtained from China. China has a high level of collectivism and reliance on established groups. In terms of cultural norms, this culture differs from western democratic societies. Comparing the impact of POS on the link between unethical leadership and employee EXB should be done with caution.

CONCLUSION

The current study sheds light on crucial concerns about unethical leadership and EXB, revealing POS as a key contingent factor and psychological empowerment construct for successfully mediating the unethical leadership–EXB relationship. This study has significant organizational implications since it offers numerous strategies for decreasing the negative effects of unethical leadership and encouraging employees to engage in extra-role activities. Furthermore, the findings of this study can be used to begin further research into additional variables and the underlying mechanisms that allow EXB to perform.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Departmental Ethics Committee, South Ural State University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Energizing Intention to Visit Rural Destinations: How Social Media Disposition and Social Media Use Boost Tourism Through Information Publicity

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This study aimed to examine the impact of information publicity on the intention of tourists to visit rural destinations in developing countries. Based on the theory of planned behavior (TPB), we examined the indirect effect of information publicity on intention to visit *via* subjective norms and further investigated the moderating effect of social media disposition and social media use. The study used data from a time-lagged design with three waves which supported the hypothesized model. The findings revealed that information publicity has an influence on the intention of tourists to visit through the mediating effect of subjective norms. Moreover, the social media disposition strengthened the relationship between information publicity and subjective norms. Furthermore, social media use positively moderated the relationship between subjective norms and intention to visit. Besides the core TPB constructs, the added variables indeed exerted a substantial impact on the visit intention of tourists. The study contributed to the tourism-related literature on social media and the practical implications were discussed.

Keywords: information publicity, social media disposition, theory of planned behavior, social media use, subjective norm, intention to visit

INTRODUCTION

How does the intention to visit rural tourist destinations be developed and strengthened to expedite economic activity that may contribute to the growth and development of the world? Tourism is a high potential industry, and the potential of rural tourism is yet to be tapped. In 2019, World Tourism and Travel Council anticipated a contribution of $39.8 billion within a decade. Even for a developing country like Pakistan, tourism is a high potential sector, which can substantially contribute to economic growth. The government in the country has also vowed to promote tourism in anticipation of a $1 trillion contribution to the economy by 2025. Sustainable tourism is being considered a tool for economic growth and development (Rafiq, 2019). Its role in wealth formation, livelihood, and income generation is well recognized (Li et al., 2018; Merli et al., 2019). Tourism is related to development, as the rising number of new destinations indicates, thus its role in socio-economic advancement is multifold (The World Bank, 2019; Zaman et al., 2021). Owing to its immense potential and contribution to socio-economic development, in the last decade, tourism literature encompassed studies on the visit and revisit intention of tourists (Tajeddini et al., 2021). Intention to visit play a key role in the growth and sustainability of tourism (Ngoc and Trinh, 2015). Intention to visit has been considered as a major determinant of growth and survival of the tourism business because it helps in forecasting marketing expenses (Kim et al., 2013), profitability (Alves et al., 2019), and sustainability of tourism business (Stylos et al., 2017). Furthermore, the trade-off between attracting and retaining the costs of tourists determines the competitive advantage (Chiu et al., 2012; Kim et al., 2013; Abbasi et al., 2021), which is also a function of tourists visit intentions.

Few studies are found on rural tourism, which attempts to reveal the decision-making processes regarding rural destinations. Rural tourism is relatively less explored, but the potential area in developing countries for tourism purposes. It can be exploited to enhance the potential of the tourism sector in countries like Pakistan (Chaudhary, 2004). As rural destinations are known for simplicity, natural and organic environment less disturbed by industrialization where green fields and forests are preserved for long, the cost of maintaining such destinations may be as low as zero. Thus, giving very cheap alternatives to highly expensive urban tourist destinations, beaches, and mountainous tourist destinations. Therefore, in this study, we have focused on the intention to visit rural destinations.

The intention to visit is influenced by several factors (García-Fernández et al., 2018) because the decision to travel is an intricate decision-making process that is affected by information publicity, social media disposition, social media use, subjective norms, attitude, and perceived behavioral control (PBC) in addition to several others (Han and Kim, 2010; Bianchi et al., 2017). Among others, social media disposition and social media use can be two conspicuous factors that may strongly influence intention to visit. Their role as facilitators of interaction between information publicity, social norms, and intention to visit may unfold several subtleties of the visit decision-making process.

Nowadays, social media and social networking sites have revolutionized the ways people receive information and news (Lou and Yuan, 2019; Khan, 2021; Mujahid and Mubarik, 2021). Even in developing countries like Pakistan, the use of social media sites like Facebook, Twitter, WhatsApp, YouTube, Flicker, and Instagram (Aftab and Khan, 2019) is high with respect to tourism-related information sharing. This bunch of social media networking sites points to the diversity and intensity of information people receive, comprising thousands of commercials, forums, blogs, vlogs, etc. (Ganguly, 2015; Lou and Yuan, 2019; Majeed et al., 2020). Young people, especially millennials and youngers, have become habitual in using social media in their day-to-day lives (Gottfried and Shearer, 2016). It has become inevitable for them to use social media to address their information needs.

One aspect of media that also affects social media use is social media disposition, which refers to social media richness and social media authenticity. Social media is a major source of information for tourists; thus, its disposition is expected to play facilitating role in realizing the impact of information being publicized in terms of reinforced social norms. The social media richness measured in terms of feedback capability, number of channels, sources of information, and language variety (Daft and Lengel, 1986) determines the ability of media to convey complex messages (Cao et al., 2021). The selection of media is made to suit the characteristics of the message and the audience (Cao et al., 2021). Another aspect of social media disposition is content trustworthiness, which may affect social norms. As social media is an open forum for all to share information, the problems related to content trustworthiness become severe. Social media users show less reliance on information from sources with a dubious disposition (Hovland and Weiss, 1951; Lou and Yuan, 2019). In such circumstances, disassociation of information from a source produces a better impact than in situations otherwise. Owing to the importance of social media disposition as a facilitator between information publicity and subjective norms, we have included it as a key moderator in our study.

Advancement in information and communication technology has resulted in a paradigm shift in the tourism business (Milano et al., 2011; Pesonen, 2011). The use of social media and social networking services is no more limited to personal use instead, people collect information, disseminate information, share feedbacks and experiences that influence the decisions of others. As tourism is an information-intensive industry, people seek information before deciding on a destination to ensure greater value for money and an enriched experience. Thus, social media play a central role in tourism decisions nowadays (Hays et al., 2012). Literature shows that there is less research on the reinforcement role of social media use intensity between subjective norms and the intention to visit of tourists.

It is evident that the theory of planned behavior (TPB) has wide application in research for understanding consumer intentions in terms of subjective norms, attitude, and PBC (Meng and Choi, 2019; Hasan et al., 2020; Meng and Cui, 2020; Soliman, 2021). In tourism-related research studies, TPB has been applied to unfold the intention of tourists to visit and revisit destinations (Hasan et al., 2020; Joo et al., 2020; Abbasi et al., 2021; Soliman, 2021). We intend to apply TPB to study the impact of social media on the intention to visit of rural tourists. This study uses TPB to examine the mechanism through which social media disposition and social media use moderate relationships between information publicity, subjective norms, and intention to visit the destinations of rural tourists. Therefore, on the one hand, this study will contribute to the extant literature on TPB; on the other hand, it is expected to contribute to the literature on tourism research, visit intention of tourists, and factors underlying the decision-making processes about tourism. Practical insights from this study will enable businesses, managers, and regulatory bodies to focus their efforts on the elements driving the intention to visit of tourists. Hence, this study will have a wide range of practical and managerial implications. The introduction of social media disposition and social media use intensity as facilitating mechanisms is unique to this study. Thus, this study will also contribute to the literature

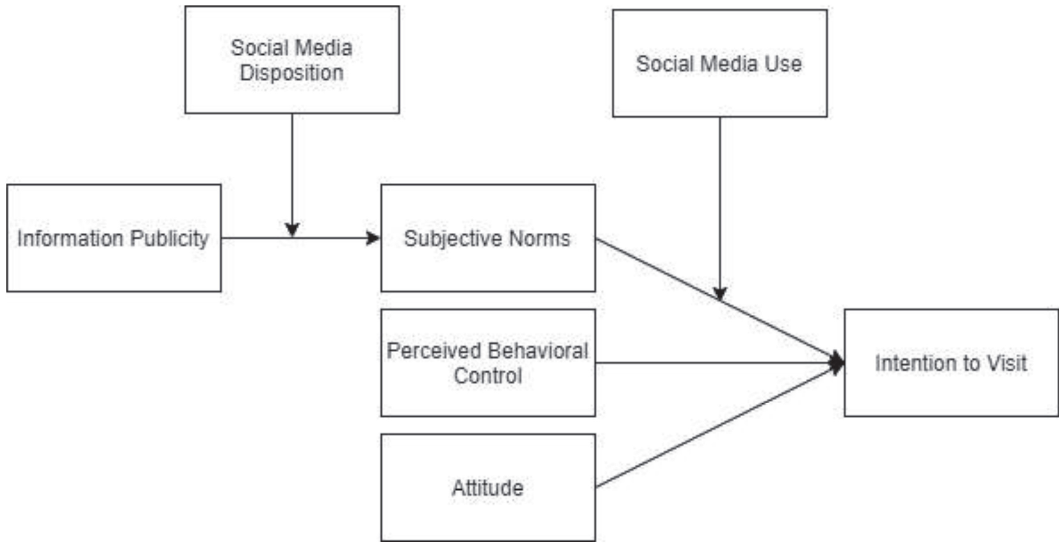

FIGURE 1 | Conceptual model of the study.

on social media research. The conceptual model of this study is illustrated in **Figure 1**.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Theory of Planned Behavior

The TPB was developed by Ajzen (1991), which aimed at understanding human behavior. As we know, decision-making is a complex process, TPB explains that when there is the intention to engage in a behavior, three distinct factors can be identified, which play a key role in developing intention and shaping behavior. Namely, attitude, subjective norms, and PBC, which embody internal (attitude) and external (subjective norms) forces that determine the extent to which an individual is likely to engage in a behavior subject to the perception of an individual about his control on engaging in that behavior (PBC), respectively (Joo et al., 2020). Many research studies have applied and validated the TPB model in various research settings (Quintal et al., 2010; Jalilvand and Samiei, 2012). Quintal et al. (2010) studied intent of visit regarding Asian tourism destination in Aussie respondents using the TPB model. Their study also tested the effect of perceived risk and perceived uncertainty on subjective norms, attitude, and PBC. As it is encouraged by Ajzen (1991) to test TPB for the decision-making process regarding tourism, hence researchers apply TPB widely in tourism studies to unfold the underlying decision-making processes. A study on wine tourism conducted by Sparks (2007) used TPB to analyze revisit intention within a year of the first visit. They found that except for the emotional attitude, all other component factors in TPB had an effect on revisit intention. Another TPB-based study on the impact of electronic word of mouth on destination choice for tourism indicated that word of mouth has become digitalized and significant (Jalilvand and Samiei, 2012; Hussain et al., 2020; Fan and Dong, 2021). The study was conducted in Isfahan, Iran, and it was found that word of mouth impacts the subjective norm, PBC, and attitude. With the rise in the use of TPB in tourism studies, its application to study sustainable tourism also rose. Kuo and Dai (2012) studied intention to visit low carbon tourism sites in the future. Several other studies use TBP in extended form (Ashraf et al., 2019; Meng and Choi, 2019) or in a framework with other theories (Lee and Jan, 2018) to study tourism-related issues. Furthermore, community-based tourism was studied by Eom and Han (2019). This study attempts to analyze the intention to visit rural tourism places using TPB as the overarching mechanism to explain the role of social media disposition and social media use intensity in connection with information publicity, subjective norms, attitude, and PBC.

Information Publicity and Subjective Norms

In this study, by information, we imply all the information related to rural tourism. The behavior of an individual is determined by the information possessed by that individual (Pettigrew et al., 2001); thus, lack of information results in the absence of related behavior. Despite the importance of tourism in socio-economic development and governmental support for promoting tourism in Pakistan, still tourist enthusiasm to visit rural destinations in low (Adeyinka-Ojo and Khoo-Lattimore, 2013; Wen and Huang, 2019). This lower rural tourism is partly attributed to the lack of information on rural tourist destinations (Mihailović and Moric, 2012). Tourists equipped with information on tourism destinations, hotels, restaurants, transportation services, and other tourism services are more likely to visit rural destinations (Li et al., 2019).

Subjective norms in our study refer to the pressure felt by individuals due to norms of significant ones in their surroundings, making them exhibit or refrain from certain behavior (Manning, 2011). In other words, if people find significant people in their family, relatives, leaders, and colleagues expecting them to engage in the desired behavior, then people are more likely to adopt that behavior (Carmeli and Schaubroeck, 2007). Thus, if family members, colleagues, and leaders prefer rural tourist destinations and want them to prefer those too, it is more likely to influence people.

Relationship between information publicity and subjective norms have been discussed in various context (Wang et al., 2018, 2019). In the context of intention to participate in voting, Bergan et al. (2021) studied the influence of information publicity and subjective norms in university students. Their study showed that information publicized to students and subjective norms significantly affects their intention to participate in voting provided that they have already overcome registration barriers. It is evident that a lack of information discounts on the influence of subjective norms. Providing information on rural tourism may subsidize the information costs of not preferring rural tourist destinations. The motivational dimension of subjective norms can be observed through the subjective norms lens. In this context, we hypothesize the following:

H1: Information publicity significantly influences subjective norms.

Subjective Norms and Intention to Visit

Subjective norms are an integral component of the TPB model, which influences behavioral intentions. These are functions of the belief of people regarding what they feel others who are important to them would do in a specific context under consideration (Kessler, 2013). In other words, it refers to the feeling of social pressure by someone due to actions and opinions of the important ones to her or him (Bianchi et al., 2017). The referent others may be friends, family, colleagues, and any other groups of people relevant to the situation. Subjective norms are a function of the interpretation of individuals regarding the referent interpretation of others when it comes to behavior and inspiration to give outlook in liking of their beliefs and expectation (Ajzen and Fishbein, 1977). Hence it can be referred to as communal pressure to enforce a behavior as the person will seek approval. In marketing and tourism literature, subjective norms have been recognized as an important driver of behavioral intentions (Quintal et al., 2015; Hasan et al., 2020). In tourism-related literature, it is empirically proven that destination choices are influenced by the opinions of tourists about whether important others will approve or not the specific vacation destination (Nicoletta and Servidio, 2012). Moreover, it has been found that the distance between the destination of tourists and their home country neither stimulates subjective norms nor expedites their development or affects their influence on intentions (Abbasi et al., 2021). To test the influence of subjective norms on intention to visit a rural destination in our setting, we hypothesized.

H2: Subjective norm significantly influences intention to visit.

The Mediating Role of Subjective Norms

A distinguishing feature of TPB from other behavioral theories is its allocation of mediating role to behavioral intent between the effects of attitude and subjective norms on behavior. All other factors affect behavioral intentions via subjective norms and attitudes. It is established that intentions are the outcome of various internal and external incentives and facilitators (Hornik et al., 1995). TPB can help to establish that information publicity and subjective norms drive intentions to visit such that subjective norms mediate the relationship between information publicity and intention to visit. Information publicity being a robust environmental antecedent of consumer behavior adds to the effects of subjective norms. Lack of information about certain aspects of tourism may cause a fall in motivation to visit. Visitors unaware of the existence of the destinations of rural tourists, tourism services, transportation facilities, reviews of tourists, experience sharing channels, and other relevant information tourists seek before picking destination are likely to lack enthusiasm (Guiver and Stanford, 2014) compared to people having necessary information (Cole, 2006).

Building on TPB, it can be suggested that information publicity is a source of enhanced subjective norms, thereby fostering social pressure felt by a person in response to subjective norms (H1). In turn, subjective norms foster the intention to visit rural destinations, i.e., the important ones in the surrounding of tourists may influence their intention to visit a particular destination because they endorse it by their experience sharing, recommendations, comments, and by sharing necessary information they have about the tourist destination, its path, travel services, hospitality services, etc. (H2). Therefore, we speculate that information publicity indirectly influences intention to visit rural destinations through subjective norms. Thus, we hypothesize the following:

H3: Subjective norm positively mediates the relationship between information publicity and intention to visit.

Behavioral Control and Intention to Visit

According to Ajzen (1991), the concept of PBC is considered as an antecedent of behavior and intentions. Furthermore, it is the perception of difficulty or ease in performing a behavior (Kastenholz et al., 2018), i.e., PBC refers to the opinion of an individual of whether they are capable of doing the behavior. PBC primarily considers the perceptions of individuals regarding how effectively dealing with aspects that may permit or limit a particular behavior. Abbasi et al. (2021) asserted in this regard that perceptions of exertion toward a behavior would have a negative impact on the intention to execute that behavior. PBC is determined by the perception of an individual regarding the availability or lack of resources and chances for executing a certain behavior, as well as the perceived significance of such opportunities and resources for doing such behavior (Mark and Christopher, 1998). Prior studies on destination choice indicate that PBC has a significant and positive influence on the behavioral intentions of individuals (Boley et al., 2018). Hence, ability, time, and resources all play a role in forecasting the intention of an individual to engage in a behavior. Therefore, we propose the following hypothesis.

H4: Perceived behavioral control significantly influences intention to visit.

Attitude and Intention to Visit

Drawing insight from TPB, attitude can be referred to as the sentiments of an individual related to the consequences of a behavior (Soliman, 2021). Attitudes can be defined as prominent beliefs which can be influenced by observation, a piece of information, or an inferential process (Sharma et al., 2021). Hence, people form favorable or unfordable attitudes about the consequences of behavior based on their beliefs. Attitudes, in turn, influence intentions to engage in the behavior. Prior studies in the field of tourism reveal a substantial positive link between attitudes toward a destination and intentions to visit (Khasawneh and Alfandi, 2019; Nguyen Viet et al., 2020). As though the beliefs of tourists regarding the consequences of traveling to a destination are likely to change (i.e., financial, time), still we may inference that their attitudes will have no differential impact on their intentions to visit despite the attitude being based on those beliefs. This leads to the following hypothesis.

H5: Attitude significantly influences intention to visit.

The Moderating Role of Social Media Disposition

People engaged in the promotion of tourist destinations might have felt strongly about the importance of social media. The majority of rural tourist enterprises are too small to afford extensive promotion (Kladou and Mavragani, 2015); on the other hand, smaller tourist destinations can also benefit from social media advertising. As a result, social media promotion is particularly crucial for rural tourism. It is simple to identify promotions conducted through social media. Tourists use social media to get information and share trip details. Amaro et al. (2016) conducted research on social media in tourism by clustering approach. They classified the study into six categories, including social media and tourist behavior. They discovered that the amount of social media-related tourism research rose rapidly after 2010. Schuckert et al. (2015) analyzed tourism-related social media studies from 2007 to 2011. Their findings revealed that social media research was performed on both supply and demand sides. Many studies have been done on the demand side to see how social media affects individuals who are trying to make travel arrangements. Also, there have been several studies on the supply side about social media as a strategy. Though social media researches for tourism have mainly focused on consumer behavior and satisfaction since 2010, several new ideas, such as big data, digital marketing, and online reviews, have lately been embraced for tourist studies (Lin et al., 2020).

Social media disposition is viewed as a positive and negative influence (Bergan et al., 2021) on the outcomes of individuals, such as intentions and behaviors. In relation to subjective norms, which address the motivation dimension of individuals, information publicity is not a very powerful inducer of changes in intentions of individuals thus, researchers prefer to explain the weakness of relation in terms of intervening variables. For example, it has been argued that mere information publicity cannot incite the behavior because information may be distorted and manipulated in the transmission process, thus losing its effectiveness. Supportive findings of Bernstad (2014) reported the ineffectiveness of written information dissemination to generate intended behavior. The study of Wang et al. (2018) elaborated that those inconsistent research results were the outcome of poor information quality. In other words, its information quality or in broader terms, social media disposition that determines the relationship between information publicity and the related behavior (Mickaël, 2014; Wang et al., 2018). Social media disposition is one of the strongest factors likely to strengthen the positive influence of information publicity. Scholars have researched social media marketing at times in order to give valuable insights for tourism advertisers. Zeng and Gerritsen (2014) examined social media usage for marketing by small and medium companies. The findings revealed that enterprises either contained much worthless content or were considerably less developed. Hays et al. (2012) discussed the proper approach to perform social marketing after studying the social marketing tactics of ten of the most famous countries for overseas tourists. Kavoura (2014) regarded the importance of social media in the tourism sector as establishing an online tourist community and stressed the significance of marketing from this perspective.

Our study speculated that the influence of information publicity on the intentions of tourists depends on social media disposition. Social media disposition is a composite of media richness and content trustworthiness. Thus, if the information receivers perceive that information provided is precise, reliable, pertinent, timely, comprehensible, and inclusive (Mickaël, 2014; Wang et al., 2018) they are more like to act as desired (Chang, 2013). Nevertheless, on the contrary, less credible and inaccurate information will weaken the relationship between information publicity and specific behavior (Lee et al., 2007; Mickaël, 2014). It means that if tourists think that information publicized to them is pertinent, useful, precise, reliable, and comprehensive, they will be tended to feel more subjective norms to develop the intention to visit (Mickaël, 2014; Zhang et al., 2017; Wang et al., 2018). In other words, if the information is perceived to be from a rich and trustworthy source, the impact of information publicity on the visit intention of tourists will be stronger (Mickaël, 2014; Zhang et al., 2017; Wang et al., 2018). Therefore, it can be speculated that social media disposition positively moderates the relationship between information publicity and the perceived subjective norms of tourists to visit the tourist sites. Thus, we hypothesize the following:

H6: Social media disposition moderates the relationship between information publicity and subjective norms such that the relationship is stronger for tourists with a higher level of social media disposition than with a lower level of media disposition.

This study is carried out to determine the bright side of social media on tourism. Social media plays a significant role in the online tourism sector when individuals make vacation schedules (Munar and Jacobsen, 2013; Molinillo et al., 2018). Kwok and Yu (2013) researched to determine the impact of Twitter and Facebook on the appeal of tourism websites. According to their findings, Facebook had a significant influence in raising the number of visits to tourism websites. Munar and Jacobsen (2014) investigated the impact of social media on the process of arranging a vacation. It was discovered that the use of social media had an effect on the original plans of tourists. People utilized social media the most after their vacations were finished to share their travel experiences with others. Travel information found on social media and provided by other users was deemed more trustworthy by social media users than information obtained from other sources (Fotis et al., 2012). Narangajavana et al. (2019) investigated the connection between tourist perceptions and social media use. Tourists who used social media more regularly viewed user-generated material more often.

Furthermore, obtaining user-generated material affected the overall image of user-generated information, which in turn influenced the expectations of visitors. Overall, people are using social media to socialize and make connections, stay up to date on events, and seek facts (Liu et al., 2018). The most prevalent social media usage of tourists is to share tour photographs and experiences (Fotis et al., 2012). As the relevance of social media usage in tourism rises, scholars aim to understand the motivations underlying social media usage (Fox and Rooney, 2015). According to Ahmed et al. (2019), motives for sharing online material include personal cognition and individual action, as well as community-related motivation. Hausmann et al. (2018) utilized social media data to investigate whether predicting the preference for environmentally friendly tourism locations was feasible. The social media data revealed specific features. It was established that tourism-related content published on social media is substantial enough to be utilized in place of traditional surveys to offer insight.

H7: Social media use moderates the relationship between subjective norms and intention to visit such that the relationship is stronger for visitors with a higher level of social media use than with a lower level of social media use.

MATERIALS AND METHODS

For the purpose of this study, we data collected purposively from residents of Lahore, Pakistan, who visited some rural destinations. To achieve the objectives of this study, we targeted tourists who were Facebook, Twitter, and WhatsApp users following the patterns of previous studies by Feng et al. (2021) for similar research objectives. Pakistan is fifth in the ranking of the most populated countries in the world whereas Punjab is the most populous province in the country with plenty of rural tourist destinations in the south and middle of the province. Lahore is in the north of the province and people usually visit several rural places for vacations. As most of the population is in cosmopolitan cities, respondents from Lahore, the capital city of Punjab represent an adequate sample and prior studies results provide evidence for generalizability of the findings to the whole country from the studies conducted on samples from cosmopolitan cities (He et al., 2020). Before the formal investigation, the respondents were informed that their participation was anonymous and they would receive a reward of Rs. 200 after completing the investigation.

The time-lagged method was utilized in this study to gather data at three-time intervals. The time-lagged technique is common in modern research since it allows researchers to perform many surveys for a specific study (Khan et al., 2020; Ali et al., 2021; Bahadur and Ali, 2021; Khan, 2021a,b; Mehmood et al., 2021a,b; Ullah et al., 2021; Yu et al., 2021). Researchers may collect data from several sources in this manner, reducing the possibility of common source bias. Furthermore, this method enables data collection at various time intervals, minimizing the likelihood of common method bias. Similarly, this method enables participants to analyze and take action their behavior before recording their final response (Detert and Edmondson, 2011). Three waves of data collection at 2-week intervals were conducted to avoid common method bias (Podsakoff et al., 2003; Ali et al., 2020; Cao et al., 2020). In the first-wave survey (T1), a survey was shared with 700 respondents. A total of 620 completed questionnaires were returned (88.5% response rate). Respondents were asked to complete the demographic information and the questions regarding information publicity, social media disposition, PBC, and attitude. The second-wave survey (T2) took place 2 weeks later; the 620 respondents were asked to report their subjective norms and social media use. The number of returned usable responses was 540 (87.09% response rate). In the third-wave survey (T3), respondents were asked to complete questions regarding the intention to visit, with 503 valid responses received (93.1% response rate). The study sample comprised 380 (75.5%) males and 123 (24.5%) females. The average age of the respondents was 29 years, 33.8% of respondents had a bachelor's degree, and 39.2% had a Master's degree. The average income of the respondent is almost Rs. 400,000.

Measures

The questionnaires utilized scales adapted from previous studies for the constructs under study and the demographic variables. All study variables were assessed utilizing a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The original questionnaire was developed in English and then translated into Urdu using the back-translation method (Brislin, 1980). To assess information publicity ($\alpha = 0.953$), a 7-item scale was used, drawn from Wang et al. (2018). The sample item: "I think the relevant information publicity for rural tourism is important." To measure social media disposition ($\alpha = 0.931$), we used an 8-item scale developed by Cao et al. (2021). The sample item: "When the social network site provides rich and varied communication and response." We used a 4-item scale to measure subjective norms ($\alpha = 0.936$), developed by Meng and Choi (2016). The sample item: "Most people who are important to me think I should go to rural tourism sites." A four-item scale was used to measure PBC ($\alpha = 0.809$), adapted from Meng and Choi (2016). The sample item: "I am capable of going to rural tourism sites." A four-item scale was adapted from Kassem (2003) to measure attitude ($\alpha = 0.914$). The sample item: "Going to rural tourism sites is enjoyable." We used a four-item scale to measure social media use ($\alpha = 0.865$), developed by Narangajavana et al. (2017). The sample item: "Using social network sites is part of my daily activity." To assess intention to visit ($\alpha = 0.915$), a 4-item scale was used, drawn from Meng and Choi (2016). The sample item: "I intend to travel to rural tourism sites in the next 1 year."

RESULTS

Descriptive Statistics

The correlation matrix, standard deviations, means, and the reliabilities of the variables of the study are displayed in **Table 1**.

TABLE 1 | Descriptive statistics, reliabilities, and correlation matrix.

	Mean	SD	CR	AVE	1	2	3	4	5	6	7	8	9	10	11
1. Age	2.700	1.10	–	–	–										
2. Gender	0.760	0.430	–	–	0.04	–									
3. Education	2.660	0.875	–	–	0.07	0.13**	–								
4. Income	2.770	1.124	–	–	0.10*	0.17**	0.70**	–							
5. Information publicity	2.863	1.510	0.924	0.732	0.04	0.18**	0.15**	0.23**	(0.953)						
6. Media disposition	3.110	1.267	0.894	0.589	0.12**	0.02	0.02	0.08	0.15**	(0.931)					
7. Subjective norm	2.845	1.375	0.935	0.782	0.02	0.01	0.02	0.07	0.45**	0.36**	(0.936)				
8. Perceived behavioral control	4.028	0.703	0.811	0.520	0.06	0.10*	0.09*	0.04	0.02	0.04	0.04	(0.809)			
9. Attitude	2.564	1.089	0.914	0.727	0.02	0.01	0.11*	0.01	0.03	0.15**	0.07	0.05	(0.914)		
10. Social media use	3.953	0.795	0.857	0.601	0.02	0.02	0.01	0.06	0.03	0.06	0.01	0.53**	0.04	(0.865)	
11. Intention to visit	3.616	1.321	0.908	0.712	0.04	0.01	0.10*	0.12**	0.31**	0.04	0.36**	0.16**	0.17**	0.13**	(0.915)

*Notes: **p < 0.01, *p < 0.05; N = 503.*

TABLE 2 | Confirmatory factor analysis.

Model	χ^2	*df*	χ^2/df	$\Delta\chi^2$ (Δdf)	TLI	CFI	RMSEA
Seven-factor model: baseline model	599.11	409	1.465		0.982	0.985	0.030
Six-factor model: combining IP, SMD, SN, SMIU	3230.18	424	7.618	2631.06 (15)	0.869	0.832	0.147
Five-factor model: combining IP, SN, PBC, AT	3478.81	425	8.185	2879.7 (16)	0.771	0.772	0.210
Three-factor model: combining IP, SMU, SN, PBC, AT	3627.75	427	8.495	3028.64 (18)	0.644	0.709	0.260
Four-factor model: combining IP, SMD, SN, PBC, AT	4342.65	429	10.122	3743.54 (20)	0.610	0.687	0.267
Two-factor model: combining SMD, SMU, SN, PBC, AT, ITV	4460.12	429	10.396	3861.01 (20)	0.514	0.583	0.279
One-factor model: combining all into one factor	4671.62	430	10.864	4072.51 (21)	0.617	0.668	0.340

Notes: IP, Information publicity; SMD, Social Media deposition; SN, Subjective Norm; PBC, Perceived behavioral control; AT, Attitude; SMU, Social media use; ITV, Intention to visit; TLI, Tucker–Lewis index; CFI, Comparative fit index; and RMSEA, Root-mean-square error of approximation.

Correlations among the variables of study provide initial support for hypothesis testing.

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was performed by using AMOS 24 to examine the convergent and discriminant validity of the studied variables by following the recommendation of Anderson and Gerbing (1988). The cut-off criteria of Hu and Bentler (1999; i.e., $\chi 2$/df less than 2; CFI greater than 0.9, and RMSEA less than 0.07) were used to test convergent and discriminant validity. We include multiple item variables to conduct CFA on individual-level data to confirm the validity of data. The results of the CFA analysis are displayed in **Table 2**. The baseline model test results show that the seven-factor was the good fit with the data ($\chi 2$/df = 599.11/409 = 1.465; CFI = 0.985; TLI = 0.982; and RMSEA = 0.03) compared with alternative models. As displayed in **Table 3**, the factor loadings (λ: cut-off criteria greater than 0.6 and $p < 0.001$) were all above 0.638, and all items observed showed significant loadings on their related factors. We also examined the average variance extracted (AVE; cut-off criteria > 0.5) and composite reliability (CR; cut-off criteria > 0.8), leading to convergent validity being supported (see **Table 3**). Together, the model proposed was deemed suitable for hypotheses testing.

Structural Model and Hypothesis Testing

We analyzed the conceptual model by using the SEM approach, and in prior studies, this approach [SEM: using Analysis of Moment Structures (AMOS) 24.0] has been extensively used (Khan and Khan, 2021). Fit indices showed that the proposed model has an adequate fit ($\chi 2$/df = 273.619/184 = 1.487; CFI = 0.981; TLI = 0.987; and RMSEA = 0.031). H1 proposed that information publicity significantly influences subjective norms. The path analysis (**Figure 2**) reveals that information publicity significantly influences subjective norms (β = 0.399, t = 8.736, $p < 0.001$), which supports H1. H2 proposed that subjective norms significantly influence intention to visit. The path analysis reveals that subjective norms significantly influence intention to visit (β = 0.358, t = 6.408, $p < 0.001$), which supports H2. The indirect effect of information publicity on intention to visit through subjective norms [0.102, 95% CI = (0.0694,0.148)] was significant, and hence, hypothesis 3 was supported. H4 proposed that PBC significantly influences intention to visit. **Figure 2** results reveals that PBC significantly influences intention to visit (β = 0.449, t = 3.891, $p < 0.001$), which supports H4. The results (**Table 2**) also reveal that attitude significantly influences intention to visit (β = 0.266, t = 4.266, p = 0.001), which supports H5.

This study further proposed that social media disposition enhances the positive effect of information publicity on the subjective norms of tourists. The relationship is stronger for tourists with a higher level of social media disposition than with a lower level of media disposition. Accordingly, the findings (**Figure 2**) reveal that there is a significant interaction between information publicity and social media disposition on the subjective norms (β = 0.11, t = 4.097, $p < 0.001$), which

TABLE 3 | Variable reliabilities and convergent validity.

Variables	Items code	λ	CR	AVE
Information publicity (IP), (Time-1)	IP1-IP7	0.832–0.935	0.924	0.732
Social media deposition (SMD), (Time-1)	MD1-MD8	0.748–0.908	0.894	0.589
Subjective norm (SN), (Time-2)	SN1-SN3	0.821–0.981	0.935	0.782
Perceived behavioral control (PBC), (Time-1)	PBC1-PBC4	0.638–0.794	0.811	0.520
Attitude (AT), (Time-1)	A1-A4	0.819–0.878	0.914	0.727
Social media use (SMU), (Time-2)	SMIU1-SMIU4	0.680–0.832	0.857	0.601
Intention to visit (ITV), (Time-3)	ITV1-ITV4	0.793–0.908	0.908	0.712

Notes: All factor loadings are significant at (p < 0.001), N = 503; λ = factor loadings, AVE, average variance extracted; CR, composite reliabilities.

supports H6. We also assessed moderating effect pattern visually following Aiken and West (1991) to plot the interaction. **Figure 3** shows that the relationship between information publicity and subjective norms becomes stronger at higher levels of social media disposition, supporting H6.

For H7, we proposed that social media use enhances the positive effect of subjective norms on the intentions to visit of tourists, such that relationship is stronger for tourists with higher-level social media use than with lower level. Accordingly, the findings (**Figure 2**) reveal that there is a significant interaction between subjective norms and social media use on the intentions to visit tourists ($\beta = 0.21$, $t = 4.117$, $p < 0.001$), which supports H7. We also assessed moderating effect pattern visually following Aiken and West (1991) to plot the interaction. **Figure 4** shows that the relationship between subjective norms and intentions to visit tourists becomes stronger at higher levels of social media use, supporting H7.

DISCUSSION AND CONCLUSION

Grounded on TPB, the findings of this study confirmed the hypotheses related to the relationships among information publicity, social media disposition, social media use, and intention to visit. As the results from the time-lagged design, it is found that subjective norms mediate the information publicity-intention to visit relationship. Therefore, we had theoretically expanded the TPB model by Ajzen (1991) in conformance with his criteria for extending the theory. With respect to overall tourist behavior, this study is a step forward in expanding and developing the theory in the existing tourist behavior literature (Han and Kim, 2010). This study, in particular, contributes valuable insights about the visit intention of tourists while broadening the TPB model by including social media disposition and social media use. The findings showed that all proposed hypotheses about direct relationships were validated. The findings revealed that PBC influences the intent of the visitor. Tourism is not something that people can live without. In addition, planning a vacation needs both time and money. Sustainable tourism, in particular, may not be the first option for individuals who have never traveled before. Subjective norms had a considerably stronger influence on the intentions of travelers to visit rural areas. The same result was demonstrated in prior studies that used the TPB model to other tourism destinations (Jalilvand and Samiei, 2012; Ashraf et al., 2019). This suggests that in order to boost popularity, it is critical to creating a positive public image of visiting tourism sites. Moreover, social media disposition strengthens the relationship

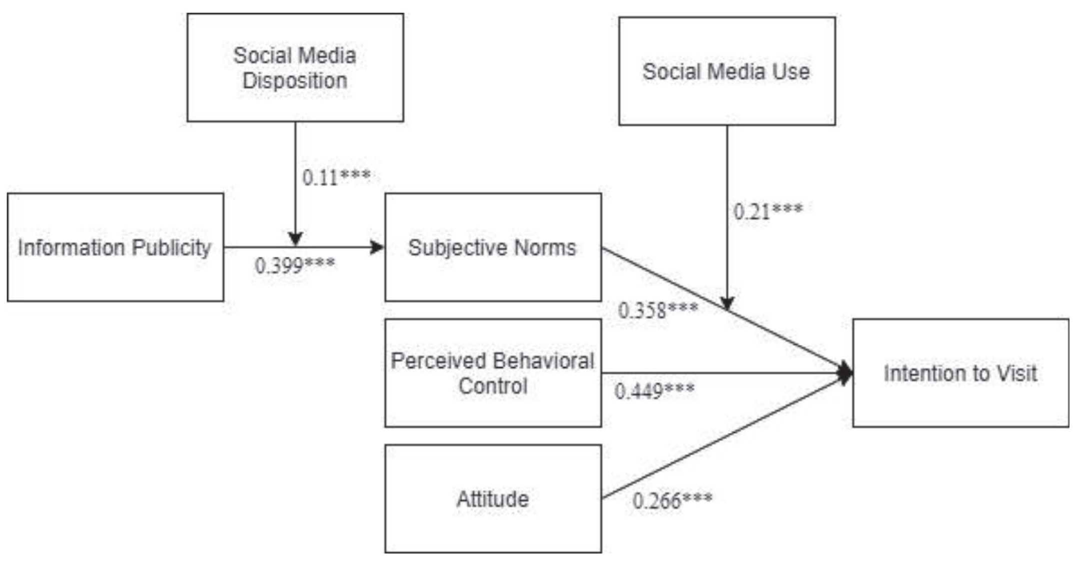

FIGURE 2 | Path analysis results; ***$P < 0.001$.

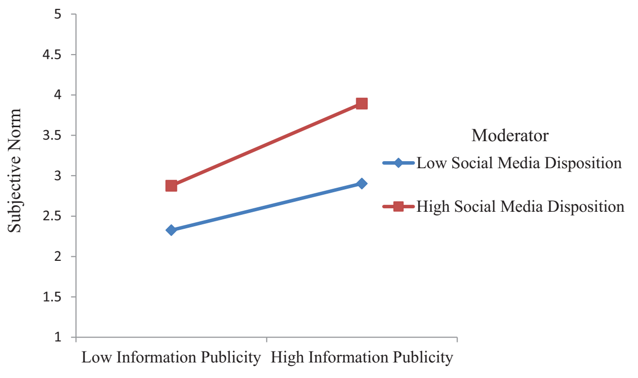

FIGURE 3 | Interactive effects of information publicity and social media disposition on subjective norm.

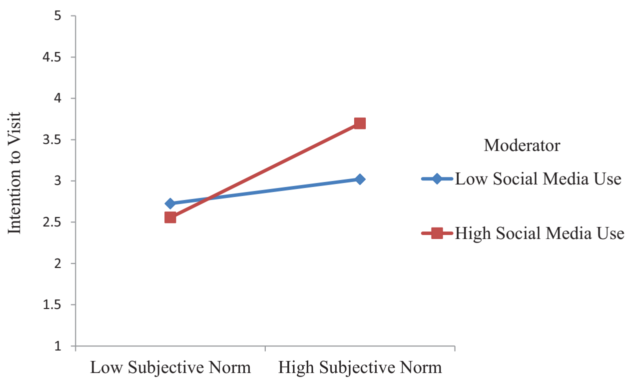

FIGURE 4 | Interactive effects of subjective norm and social media use on intention to visit.

between information publicity. Additionally, social media use also strengthens the relationship between subjective norms and intention to visit, such that the relationship is stronger when social media use is at a high level than for those with a low level of social media use.

Theoretical and Practical Implications

The findings of this study offer several meaningful theoretical contributions to the tourism-related literature in many ways. First, this study employed the TPB to investigate how social media disposition and social media use boost the visit intentions of tourists. To the best of our knowledge, this is the first research of its nature that has expanded the TPB model to explain the variables influencing the visit intentions of tourists. Prior studies on tourism in Pakistan have mainly focused on tourist destination image (Nazir et al., 2021), but no study has explored the factors that influence the visit intention of tourists by using social media disposition and social media use.

Second, to extend the TPB and improve the tourism-related body of knowledge, this study used information publicity, social media disposition, and social media use. The conceptual model of this study, which included the variables of information publicity, social media disposition, and social media use, enables elucidating a significant proportion of the visit intentions of tourists and demonstrates the compatibility of the model. The addition of these variables broadens the existing tourism-related literature on TPB because no other study has given a holistic model that incorporates all examined factors to demonstrate their influence on tourist visit intentions.

Third, the findings of this study, particularly regarding the antecedents of the TPB, such as subjective norm and attitude, add to the existing body of knowledge. These findings contradict the findings of previous research (Abbasi et al., 2021), particularly in the context of tourism in South-Asian countries. Pakistan is a developing South-Asian country that is culturally and expressively distinct from the developed countries where previous studies were conducted. Thus, the implementation of the TPB in the South-Asian region throws fresh light on the model of the TPB and opens up new avenues for future scholars to study how these aspects may be studied further in future research.

Finally, because this study focuses on the tourism industry in a developing nation such as Pakistan, it contributes to and broadens the existing knowledge about the tourism industry from a relative viewpoint. Most prior tourism studies sampled developed countries. Due to cultural variations between countries, findings from one country may not apply to other countries, which may have distinct preferences and expectations based on common cultural or societal norms (Huang and Crotts, 2019).

This study was practically beneficial for local and global social media advertisers and managers seeking to reach tourists and influence their intentions to visit. Especially insights from this study could prove beneficial for rural tourism destinations managers, travel services, travel consultancy providers, and related hospitality services providers. Understanding and expanding on the knowledge gained from this study would allow the people related to the tourism industry of the country to strategize to get a strategic advantage in this lucrative industry.

First, to gain an edge, tourist destinations managers, restaurants, hotels, travel agency services, tour advisers, tour consultants, and other tourism-related services providers should develop strategies for information publicity using social media to boost the intentions of visitors to visit while focusing on the satisfaction of tourists by giving more value for money and better service to increase their intention to visit. Identifying the information of tourists needs to help them choose rural destinations over other choices is vital for effectively strategizing. Tourists need information on several aspects of tour-related questions while planning and choosing a tour destination. In this regard, information on the availability of travel services, hospitality services, scenic views, adventure supports, security, safety, and price of various services may be important for different tourists subjectively. In the context of rural destinations, availability of amenities of life, cultural food, unique spots for locally famous food, spots for recreation, security of routes, cultural values of local people, folk tales, etc., may be an essential part of the information necessary to trigger visit intention. Advertisement of such locations, services, and reviews about the satisfaction and picture sharing on social media of travelers can be considered a vital source of social norm building, which may help visitors choose rural locations over other options.

Second, tourism-related services providers are recommended to establish an online presence and urge their travel customers to share their vacation photographs on social media sites, which induces benign envy in consumers (Latif et al., 2020), triggering travel desire. The significant presence of tourism-related services providers from any destination and any destination contributes to the subjective norm development. The tourism-related services providers, especially brands known to customers, may act as significant ones that develop pressure on tourists to choose a particular location supported and recommended by those service providers, which they trust or with whom they had a great experience in the past. Thus, the feeling of pressure because of subjective norms, in turn, forms the intention to visit. Therefore, it can be asserted that rural destinations and tourism service providers for rural destinations should not ignore the importance of their online presence on social media.

Third, this study finding revealed that social media support rural tourism-related decision-making processes of tourists. On the one hand, the disposition of social media is key to convince tourists to choose a rural destination over others. Enriched content, factual information from reliable channels, and candid reviews from social media users may change the stats of the industry in the country. On the other hand, when tourists take rural tourism into account, the societal environment and the situations of individuals really contribute to encouraging their visiting intentions. Therefore, it may be stated that marketers should prioritize information linked to subjective standards to support the growth of sustainable tourism. Marketing practices should foster social norms and emphasize the functional benefits of rural tourism rather than just the attractions of the individual tourist sites. Sustainable tourism growth might help to promote the focus of marketers on fostering the sharing of tourism experiences on social media. Developments may be made to enable and promote the act of sharing through social media (e.g., attractive photographic spots and sites). Marketers may also arrange certain events for tourists, including activities to share on social media, such as awards for uploading scenic posts. Events that can go beyond personal enjoyment to sustained societal benefits might promote more strong subjective norms through social media disposition.

Limitations and Future Research

This study employed time-lagged data, which generally controls the common method bias (Podsakoff et al., 2012), so common source bias and common method bias were not big concerns. Despite these advantages, our study has several limitations. First, the data were collected from a single type of industry located in the Lahore city of Pakistan, hence, it cannot be generalized to other industries and national contexts. Second, although our data were collected from tourists, which could be considered as a more than adequate setting for the tourism sector in terms of studying social media use for the attraction of tourists and further studies may broaden this focus to include different geographical areas, cultures, or times to increase the generalizability of the model. Western and Eastern tourists perceive tourism-related decision-making differently (Müller et al., 2021), and the comparison process differs depending on individualist/collectivist culture (Mehmood and Hussain, 2017a,b; Mehmood and Li, 2018; Li et al., 2019; Mehmood et al., 2019, 2020; Jabeen et al., 2020; Latif et al., 2020). As a result, future cross-cultural research on Western and Eastern cultures would be fascinating.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

KM, YI, and YS conceived the idea and helped in writing the introduction and literature review. YI and AA collected the data. KM and YI wrote the discussion, conclusion, and implications of the study. LS helped in writing the Literature Review. All authors have read and approved the final manuscript.

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Effect of Enterprise Social Media on Employee Creativity: Social Exchange Theory Perspective

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This study applied an artifact-centric view to investigate the consequences of enterprise social media usage. It investigates how enterprise social media usage influences employee creativity. A moderated mediation model is developed based on social exchange theory. The empirical sample of 238 employees is used to test the proposed model. Results of the empirical analysis performed using PROCESS macro of SPSS indicate that enterprise social media usage positively impacts employee creativity via the mediating mechanisms (i.e., leader-member exchange and support for innovation). Furthermore, social media usage frequency negatively moderates this impact of enterprise social media usage on employee creativity via leader-member exchange. Interestingly, the empirical analysis reveals that the impact of enterprise social media usage frequency strengthens the indirect effect that enterprise social media usage has on employee creativity via perceived support for innovation.

Keywords: enterprise social media usage, leader-member exchange, support for innovation, social media usage frequency, employee creativity

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INTRODUCTION

Social media is extensively used in organizations around the world (Liang et al., 2020). Social media is used with the perception that it will increase the efficiency of interaction among organizational members (Chen et al., 2019), facilitate knowledge exchange (Wei et al., 2020), and increase customer satisfaction (Casper Ferm and Thaichon, 2021). Considering associated benefits, a majority of companies from the group of Fortune 500 have adopted social media (Ali et al., 2020). Yet, besides its benefits, studies have noted that social media use by employees can have negative consequences. For example, Salo et al. (2018) and Cao and Yu (2019) noted that social media use is related to a decrease in employee performance. Furthermore, Bao et al. (2020) found that social media use can result in fatigue and frustration. Thus, this backlash of social media for employees suggests further development of research and theory to understand the consequences enterprise social media use might have for the development of organizations and the performance of its employees.

Even though many organizations are ambivalent in social media adoption. However, the Covid19 pandemic has changed the work structures, especially how knowledge workers perform their jobs (Trougakos et al., 2020). Due to the Covid19 pandemic, approximately 50% of the knowledge workers now work remotely from home (Kuruzovich et al., 2021). In addition, this study noted the possibility that remote work or work from home may last for more years to come. This suggests that the implications of enterprise social media usage for employee performance are critical, especially in the current remote work situation. Thus, a study to investigate the impact of enterprise social media usage and employee performance is important to increase our understanding of how social media may affect employee job performance.

A literature review indicates that enterprise social media has mixed positive and negative impacts on employee performance outcomes. For instance, Ali et al. (2021a) found a positive relationship between enterprise social media usage and innovation performance. Meanwhile, contrasting to above, Yu et al. (2018) noted that when employees excessively utilize social media, this brings negative consequences to their performance. The inconsistencies in the empirical studies might be because studies generally focus on knowledge management and social capital which limits the scope of mechanism that might link social media with job related outcomes (Pitafi et al., 2018; Ali and Bahadur, 2019). Therefore, considering previous inconsistencies, recent studies have suggested theoretically elaborate and empirically test how enterprise social media brings benefits to employees. Especially, studies have asked called to investigate how social media can enhance employee creativity (Sigala and Chalkiti, 2015; Wang et al., 2021).

To answer the above calls, this study argues that a theoretical integration of information systems literature and organizational behavior literature might bring novel insights into how enterprise social media is linked with employee creativity. From the perspective of information systems, we consider enterprise social media as a technological artifact (Cao et al., 2021). From the organizational behavior perspective, we draw on social exchange theory to propose a mechanism that links enterprise social media usage with employee creativity. Social exchange theory is used because it explains social and psychological processes that underlie employees' job-related behavior and outcomes. Based on the social exchange theory, we identify social and psychological processes mechanisms to explain the relationship between our technological artifact (enterprise social media) with employee creativity and social media externalities as a moderator in these relationships. Thus, different from previous studies linking social media with employee performance through knowledge-centric mechanisms (Liu et al., 2014; Chen et al., 2019; Nisar et al., 2019; Ali et al., 2020), we build a theoretical model that includes both information systems perspective and organizational behavior perspective.

Our study makes some valuable contributions to the social media and creativity literature. First, this study answers the calls to conduct more theory-driven research to explain the consequences of enterprise social media usage. In doing so, we use social exchange theory to investigate how enterprise social media usage by employees is linked to their creativity. Particularly, we identify LMX and SFI as key mechanisms that link social media use with employee creativity. Second, we investigate enterprise social media usage frequency as an important moderator that strengthens the impact of enterprise social media usage on employee creativity via a social exchange mechanism. Third, this study contributes to the existing literature on information systems by investigating social exchange mechanisms differently than previous studies which are predominantly focused on knowledge-oriented mechanisms linking social media with employee job outcomes.

Theory and Hypotheses

Theoretical Foundation: Social Exchange Theory

Social exchange theory (Blau, 1964) describes the behavior during long and short-term relationships where tangible (i.e., money) and intangible resources (i.e., social support) are exchanged. Social exchange theory in particular describes the social exchange of tangibles and intangibles as a social exchange process. This theory has been applied to illuminate numerous circumstances and behaviors. For instance, social exchange theory is used to explain the behavior of customers (Casper Ferm and Thaichon, 2021), employee job performance (Kuruzovich et al., 2021), inter-organizational exchanges, and trust (Lioukas and Reuer, 2015), and the relationship between leader and peers (Miao et al., 2014). At its core, social exchange theory argues that social exchanges are made among actors over the time of their relationship creating trust, affect, and loyalty (Blau, 1964; Quade et al., 2020). Social exchange is a reciprocal process between interaction partners (Adams, 1963). For example, a transaction of tangible or intangible resources would be reciprocated by the receiving exchange partner at some time in the future. Although researchers have studied creativity from a variety of theoretical perspectives (Santos et al., 2015; Tu et al., 2018; Klasmeier and Rowold, 2020; Ali et al., 2021b), due to the social nature of creativity (Amabile, 1996; Perry-Smith and Shalley, 2003; Grosser et al., 2014), social exchange theory provides a useful lens to investigate social exchanges processes among organizational members using enterprise social media that eventually enhance employees creativity.

LMX and SFI represent two important constructs that compute aspects of social exchange. LMX, as suggested in the literature is related to the exchange of resources between employees and their leaders (Graen and Uhl-Bien, 1995). On the other hand, SFI involves an exchange between peers (Ali et al., 2021b). This exchange relationship resultantly develops perceived support for innovation by the employees (Anderson and West, 1998). Although, LMX and SFI are theoretically distinct, yet, these exchange relationships dominantly provide the foundation in social exchange theory to capture the processes that affect employees' behavior and job outcomes. Moreover, although, previously, studies have noted the importance of these factors, yet, in the context of social media, these factors have not been studied in any detail, nor LMX and SFI are collectively used in a study. This study proposes that LMX and SFI are important mechanisms that link enterprise social media usage with employee creativity. **Figure 1** presents the proposed theoretical model of this study.

Hypotheses Development

Social Exchange and Employee Creativity

The social model of creativity proposes (Perry-Smith and Shalley, 2003) that creativity is a social process that involves exchange among individuals. Accordingly, creativity is one of the key consequences of social exchange processes (Cao and Ali, 2018). As such, LMX and SFI have positive implications for employee creativity. When individual employees work in the conditions of a high level of LMX and SFI, they feel a sense of indebtedness

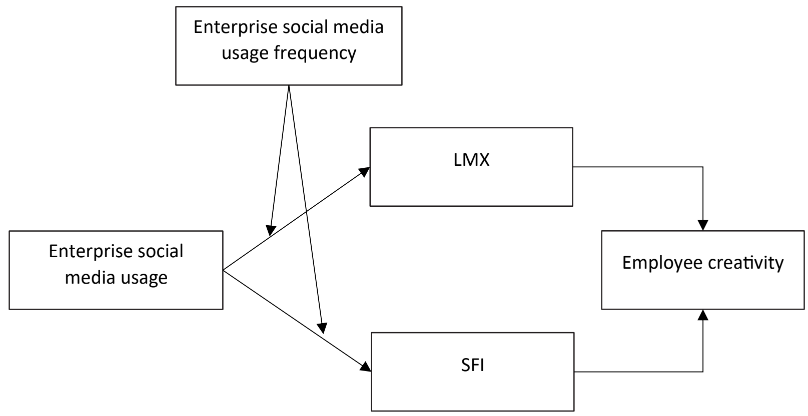

FIGURE 1 | Proposed theoretical model.

and obligation to the sources of treatment. Accordingly to the social exchange norm of reciprocity (Adams, 1963), employees feel motivated to repay the resources in a form that is appreciated by the resource providers. When the exchange partner is a leader or supervisor (LMX), employees feel confident in meeting job requirements by taking indicative and sharing ideas to meet leader expectations. When the exchange partner is a co-worker, employees feel confident that their ideas are valued, and their co-workers are supportive of their creative ideas. Together, LMX and SFI employees demonstrate a high level of commitment toward creatively solving problems and generating solutions to defuse situations. More precisely, LMX and SFI may enhance employee creativity by creating efficiencies through social exchange. For instance, on one hand, LMX may enhance employee creativity because knowledge exchange with leader, gaining valuable resources, and political clout of managers is important for an employee to take a risk and adopt creative ways of performing their tasks (Zhao, 2015; Hu et al., 2018; Tu et al., 2018). On the other hand, SFI may contribute to employee creativity again by providing cognitive resources and support for creative actions (Ali et al., 2021b). This is because creativity needs the exchange of ideas and support for co-workers in order to improve ideas and select a creative idea which is also useful (Shin and Zhou, 2003). In summary, LMX and SFI are might contribute to employee creativity by providing them the necessary resources through social exchanges with leaders and peers which are argued to enhance employee confidence and ability to generate creativity (Shin and Zhou, 2003, 2007).

Social Exchange and Employee Creativity

The social model of creativity suggests that creativity is a process of social exchange among members (Perry-Smith and Shalley, 2014). Accordingly, we identified LMX and SFI as key exchange factors influencing employee creativity. For instance, when employees receive a favorable LMX and SFI, they may feel a sense of indebting to the sources of LMX and SFI. In line with the sense of reciprocity, employees try to reply to the sources in a favorable way which may be valued by the sources. When the exchange partner of an employee is the leader (i.e., LMX) reciprocal behavior may include sharing creative ideas and taking a risk, and generating creative solutions to the problems (Zhou et al., 2018). Meanwhile, when the exchange partner is a peer or co-worker (i.e., SFI), an appropriate reciprocal behavior could be shared and discuss ideas, knowledge, and perspectives to identify novel and effective ideas and increase creativity (Ali et al., 2021b). Together, LMX and SFI, therefore, increase employee creativity as frequent exchange processes with others in the organization provide valuable resources that help employees to develop novel and useful ideas.

The Mediating Role of Social Exchange Processes

We believe that social exchange will play a role in mediating the relationship between employee creativity and the use of social media in the workplace. Enterprise social media usage is may bring additional benefits to exchange processes by easing the interaction and communication among members of an organization, therefore, positively affecting the relationships among individuals. Moreover, research has indicated that social media use by employees creates an understanding of knowledge, personality, and attitude among individual employees (Ali et al., 2019). This reduces the uncertainties regarding work-related behaviors and social related behaviors of employees and leaders. Such understanding is likely to make it easy for employees to fully interpret the LMX relationship with the leader. Moreover, the LMX relationship is characterized by mutual trust and respect, which are easily observed when interactions are not ambiguous and interaction partners can easily interpret. In addition, an important characteristic of enterprise social media usage is that it enables collaborative conditions (Cardon and Marshall, 2015). Since, enterprise social media usage creates situations in which employees discuss, share, and support the work of each other to complete the task efficiently (Majchrzak et al., 2013), it may create a perception that other co-workers provide support for innovation and thus an employee is more confident to generate creative ideas discuss it with other employees using social media to identify original and effective ideas. Additionally, enterprise social media provides a tool that encourages and eases the social exchange relationships (i.e., LMX and SIP) among individuals to support each other as they work toward attaining creativity (Ali et al., 2019). For the above reasons, we draw on social exchange theory to identify that enterprise social media usage by employees and leaders affects their social exchange relationships in a way that these exchange relationships provide support to individuals to exchange resources and support to generate creative solutions.

In sum, based on the social exchange theory, we establish how LMX and SIP are promoted through the use of enterprise social media by individuals in an organization to enhance their creativity.

Hypothesis 1: LMX mediates the relationship between enterprise social media usage and employee creativity.

Hypothesis 2: SFI mediates the relationship between enterprise social media usage and employee creativity.

Enterprise Social Media Usage Frequency and LMX

In this section, this study proposes that through a reduction in the quality of LMX, the frequency of company social media usage will have a detrimental impact on the link between enterprise social media usage and employee creativity. Enterprise social media usage contributes to enhancing the exchange relationships by facilitating interaction and communication among employees (Zhang et al., 2019). A review of the literature reveals that using enterprise social media influences performance outcomes depending upon the usage frequency by employees. Such as, Cao and Yu (2019) noted that when employees extensively use social media at work this is negatively related to their performance. Managers with more frequent access to enterprise social media that is managers more frequently interact with subordinates using social media may lead to interactional uncertainty among leader and sub-ordinates compared with face-to-face interaction, resulting in low quality exchange relationships. This maybe particularly important in the context when leaders extensively use social media because in such situation exchange resources such as feelings of positive effect, warmth, and gestures may not be transferred to the followers. If such exchange resources cannot be transferred in social exchange through LMX interaction in enterprise social media and there is less opportunity for face-to-face interaction due to extensive social media use. Enterprise social media usage is likely to hinder the development and maintenance of LMX resulting in a low level of employee creativity. Therefore, we hypothesize that.

Hypothesis 3: Enterprise social media usage frequency will moderate the indirect relationship between enterprise social media usage and employee creativity via LMX such that the indirect relationship becomes weak when leaders more frequently use enterprise social media.

Enterprise Social Media Usage Frequency and SFI

In this section, this study states that the association between enterprise social media usage and employee creativity via SFI will also be hampered by the frequency of enterprise social media usage. Enterprise social media can contribute to enhancing social exchange relationships by improving employee perceptions that co-workers are supportive in generating innovative solutions. There is theoretical and empirical support that SFI leads to increased creativity by creating favorable and supportive work conditions (Ali et al., 2021b). Additionally, research has suggested that creativity is a social process (Perry-Smith and Shalley, 2003), this social side is of creativity is supported by enterprise social media usage (Ali et al., 2020). Yet, extensive use of enterprise social media might decrease the quality of interaction. That is when employees more use enterprise social media to interact with each other, this decreases face-to-face interaction. By using extensive enterprise social media employees are unable to know other communication signals and social support which is possible in physical interaction, thereby decreasing the perceptions about support for innovation provided by co-workers. In other words, to the extent to which employees feel supported by co-workers through the use of enterprise social media, they will have a lower level of perceived SFI when they are more frequently using enterprise social media to interact with each other, resulting in a lower level of creativity.

Hypothesis 4: Enterprise social media usage frequency will moderate the indirect relationship between enterprise social media usage and employee creativity via SFI such that the indirect relationship becomes weak when employees more frequently use enterprise social media.

Research Methods

Field Settings and Data Collection

We used a survey method to test the hypotheses of this study. This methodology allows capturing the essence of the fieldwork, therefore it is considered an appropriate method to study our variables (Liu et al., 2014). Data were collected from employees working in companies in developing region. Following previous studies (Cao and Ali, 2018; Pitafi et al., 2018; Khan et al., 2019; Cao et al., 2021), data were collected from employees working in multiple companies.

At first, 21 companies were identified using academic-industrial networking located in developing region. Then, we made telephone calls to HR managers and sent them the invitation email explaining the purpose of this research and requesting their voluntary participation. The HR managers were guaranteed the confidentiality of the data collected from their employees. Through this process, managers of seven companies agreed to participate in the survey. Second, we conducted informal interviews of the HR managers to confirm that employees use enterprise social media to communicate and interact with each other.

After the initial process, HR managers are considered an appropriate source of authentic information about organizational policies and practices. HR department supported us to distribute the questionnaire to the employees at two points in time. In phase one, we distributed the questionnaire to 391 employees. In response, we received 261 responses. One month later in phase two, we distributed the questionnaire to the respondents of the first phase and asked them to rate their creativity. In response, we received 243 responses. After removing incomplete responses, we have 238 useful responses from the employees. The demographic characteristics of the respondents indicate that there are 123

(51.7%) female respondents and 115 (48.3%), male respondents, most of the respondents' age (79.8%) is below 35 years, and most of the respondents have a bachelor degree (53.4%).

Measures

We used all scales validated from previous studies. In the survey, all items were measured using 7 points Likert scale (1 = strongly disagree to 7 = strongly agree). ***Enterprise social media*** is measured using six items adapted from Ou and Davison (2011). Previous studies (Cai et al., 2018; Pitafi et al., 2018) have validated this measure. The social exchange processes were measured using validated measures from the literature. Particularly, ***LXM*** was assessed using four items. These items are adopted from the study of Graen and Uhl-Bien (1995). For ***SFI,*** three items were adapted from Anderson and West (1998). We asked employees to provide the ***frequency of using enterprise social media*** by the number of times they use enterprise social media to interact, communicate, and exchange knowledge with each other. Finally, a self-reported measure of ***employee creativity*** was adopted from Farmer et al. (2003). This is a validated approach in previous studies to measure the creativity of employees using self-ratings (Ding et al., 2019).

Since all survey measures are self-reported, this could bring the possibility of common method bias (Podsakoff and Organ, 1986). Therefore, to avoid such potential effect of common method bias on the results of this study, we adopted two methods. First, we measured dependent variables at different times, such time-lagged surveys could mitigate the potential arousal of common method bias (Podsakoff et al., 2003). Second, to investigate the likelihood of common technique bias, we used Harman's single factor test (Harman, 1976). Results indicate that no single factor accounted for a majority of the variance. Indeed, the first factor accounted for 23% of the total variance, and the Eigen value of 4 factors was greater than 1 cumulating 64% of the total variance. Thus, the test results suggest that common method bias is not a serious issue in our study.

RESULTS

We performed data analysis using SPSS. Particularly, we used PROCESS macro a plugin to test mediation hypotheses and moderated mediation hypotheses of this study. This tool is commonly used for exploratory research conducted by previous studies (Eissa and Lester, 2017; Islam et al., 2020; Bahadur and Ali, 2021). We conducted the data analysis in two phases. First, Model 4 of PROCESS macro is to test the mediation effect. Thus, we used it to test the mediation hypotheses. Second, we used Model 7 of PROCESS macro to test the moderated mediation hypotheses.

Table 1 correlation matrix shows the reliabilities, correlations among key variables of the study. This table provides initial evidence of the support for our model.

For hypotheses testing, first, Hypothesis 1 proposed that enterprise social media usage is positively related to employee creativity via LMX. Results in **Table 2**, based on a bootstrapping technique using 10,000 bootstrap sample indicate that there is a significant indirect of enterprise social media usage with employee creativity via LMX (Effect = 0.06, *SE* = 0.04, at 95% LLCI = 0.0038, ULCI = 0.1500). The hypothesis predicted that SFI mediates the relationship between enterprise social media usage and employee creativity. Accordingly, the results indicate that there is significant indirect effect of enterprise social media usage on employee creativity via SFI (Effect = 0.04, *SE* = 0.02, at 95% LLCI = 0.0007, ULCI = 0.0796). Together, the empirical analysis provides support for the mediation hypotheses of this study.

Next, we tested the moderated mediation hypotheses of our model. Hypothesis 3 predicted that enterprise social media usage frequency will moderate the indirect relationship between enterprise social media usage and employee creativity via LMX such that the indirect relationship becomes weak when leaders more frequently use enterprise social media. As hypothesized, the results in **Table 3** shows that the indirect effect of enterprise social media usage on employee creativity via LMX is strongest when frequency to use enterprise social media is low (Effect = 0.11, *SE* = 0.05, at 95% LLCI = 0.0306, ULCL 0.2054), then when frequency to use enterprise social media is at mean level (Effect = 0.06, *SE* = 0.04, at 95% LLCI = 0.0056, ULCL 0.1515) and at high level (Effect = 0.02, *SE* = 0.05, at 95% LLCI = −0.068, ULCL 0.1372). Thus, the results support Hypothesis 3.

Hypothesis 4 predicted that enterprise social media usage frequency will moderate the indirect relationship between enterprise social media usage and employee creativity via SFI such that the indirect relationship becomes weak when employees more frequently use enterprise social media. Contrary to the proposed hypothesis, our results indicate that indirect effect of enterprise social media usage on employee creativity is stronger when employees more frequently use enterprise social media to interact and communicate with colleagues (Effect = 0.02, *SE* = 0.03, at 95% LLCI = −0.0355, ULCL 0.0872) than when the usage frequency is at mean level (Effect = 0.04, *SE* = 0.02, at 95% LLCI = 0.0003, ULCL 0.0836) or low level (Effect = 0.06, *SE* = 0.03, at 95% LLCI = 0.0091, ULCL 0.112). Thus, the results do not support hypothesis 4.

DISCUSSION AND IMPLICATIONS

Theoretical Contributions

This study makes several important contributions to the existing research. First, the model of this study integrates social media and organizational behavior to provide a comprehensive theoretical explanation regarding how enterprise social media is linked with employee creativity. In doing so, we identify LMX and SFI as essential mechanisms using social exchange theory that link enterprise social media usage with employee creativity. Thus, this study theoretically elaborates and empirically tests how enterprise social media usage is associated with employee creativity through LMX and SFI.

Second, this study further extends the existing theory related to enterprise social media usage by theorizing that frequency of using enterprise social media is an important boundary condition that affects the indirect relationship between enterprise social media usage and employee creativity via LMX and SFI.

TABLE 1 | Correlation matrix.

Variables	Mean	*SD*	1	2	3	4	5	6	7	8	9
1. Age	1.48	0.50	–								
2. Gender	1.77	0.83	−0.08	–							
3. Education	3.39	0.62	0.09	0.07	–						
4. UE	2.38	0.57	−0.05	0.02	−0.02	–					
5. ESMU	3.59	0.69	−0.02	0.04	0.00	0.11	0.84				
6. LMX	3.74	0.67	0.02	−0.03	0.05	−0.07	0.17**	0.80			
7. SFI	3.04	0.98	0.10	−0.02	−0.04	0.05	0.14*	0.06	0.79		
8. UFR	2.78	0.98	−0.04	−0.04	−0.07	−0.09	0.00	0.04	−0.09	–	
9. ECR	3.37	0.99	−0.03	−0.08	−0.09	0.10	0.16*	0.25**	0.23**	0.03	0.85

**p < 0.05, **p < 0.01, reliabilities in diagonal cells, UE, enterprise social media usage experience, ESMU, enterprise social media usage, LMX, leader member exchange, SFI, support for innovation, UFR, enterprise social media usage frequency, ECR, employee creativity.*

TABLE 2 | Indirect effect of enterprise social media usage on employee creativity via LMX and SFI.

Mediator	Independent variable	Dependent variable	Effect	SE	LLCI	ULCI
Total effect	EMSU	ECR	0.10	0.04	0.0311	0.1884
LMX	EMSU	ECR	0.06	0.04	0.0038	0.1500
SFI	EMSU	ECR	0.04	0.02	0.0007	0.0796

N = 238; ESMU, enterprise social media usage; LMX, leader member exchange; SFI, support for innovation; ECR, employee creativity; SE, standard error; LLCI, lower limit at 95% confidence interval; ULCI, upper limit at 95% confidence interval; bootstrap sample size 10,000.

TABLE 3 | Conditional indirect effect of enterprise social media usage on employee creativity via LMX and SFI at level of enterprise social media usage frequency.

Moderator	Mediator	Independent variable	Dependent variable	Moderator value	Effect	SE	LLCI	ULCI
UFR	LMX	EMSU	ECR	−0.98	0.11	0.05	0.0306	0.2054
UFR	LMX	EMSU	ECR	0.00	0.06	0.04	0.0056	0.1515
UFR	LMX	EMSU	ECR	0.98	0.02	0.05	−0.068	0.1372
UFR	SFI	EMSU	ECR	−0.98	0.02	0.03	−0.0355	0.0872
UFR	SFI	EMSU	ECR	0.00	0.04	0.02	0.0030	0.0836
UFR	SFI	EMSU	ECR	0.98	0.06	0.03	0.0091	0.1120

N = 238; ESMU, enterprise social media usage; LMX, leader member exchange; SFI, support for innovation; UFR, enterprise social media usage frequency; ECR, employee creativity; SE, standard error; LLCI, lower limit at 95% confidence interval; ULCI, upper limit at 95% confidence interval; bootstrap sample size 10,000.

On one hand, we found that enterprise social media usage frequency can reduce the strength of the positive indirect effect of enterprise social media usage on employee creativity via LMX. This suggests that though enterprise social media usage facilitates the social exchange process among employees and leaders of an organization, yet, more frequent use of enterprise social media can negatively impact the quality of these exchange processes (LMX) and related employee creativity. On the other hand, interestingly, we found that when employees more frequently use enterprise social media to interact and communicate with their co-workers, this strengthens the indirect effect of enterprise social media usage on employee creativity via SFI. This brings an interesting insight into the impact of enterprise social media usage on social exchange relationships and employee creativity. We invite future scholars to shed light on the differentiated nature of exchange relationships and suggest scholars investigate other antecedents of exchange relationships.

Finally, this research adds to our knowledge of the impact of enterprise social media usage. More broadly, this study answers the calls to understand how the use of enterprise social media might affect employee creativity through alternative theoretical perspectives (Sigala and Chalkiti, 2015; Wang et al., 2021). This study based on the social exchange theory, provides a framework to integrate enterprise social media usage, social exchange relationships, and enterprise social media usage frequency, to understand employee creativity. Thus, our moderated mediation model further contributes to our understanding of the mechanisms and implications of enterprise social media adoption by organizations.

Practical Implications

In this study, we found that enterprise social media usage has significant implications for employee creativity. These findings provide important implications for the managers. Managers who want their employees to generate creativity should adopt social media technologies to facilitate their interaction and communication. Especially, in the current pandemic situation, the use of enterprise social media is found to have a valuable impact on employees' creativity. In doing so, managers should encourage subordinates to share their ideas and knowledge. For example, managers can assign group tasks to the employees to increase their interaction and promote exchange relationships among them.

Second, we found that the indirect impact enterprise social media usage has on employee creativity via LMX would be weaker when employees more frequently use enterprise social media. This suggests that solely relying on enterprise social media for interaction, communication, and exchange of knowledge and idea with leaders has negative implications for employees' creativity. As such, though, organizations adopt social technologies to facilitate employees and enhance their creativity and task performance (Wei et al., 2020), yet, employees need to control their use of social technologies, and should also have physical interaction and meetings with leaders. Physical interaction may enhance their quality of exchange relationships resulting in higher creativity. Yet, on the other interestingly, frequent social media usage has strengthened the impact of enterprise social media usage on employee creativity via SFI. This indicates that exchange relationships among colleagues when supported by frequent social media users create a sense that employees support ideas, and support each other to produce more creativity. Thus, managers are suggested to develop an integrated work system in which employees use social technologies and also have physical interaction and meetings. This will create a better understanding of the skills and knowledge and create a collaborative workplace where creativity is supported (Ali et al., 2019). This integration may facilitate the type of interactions that are supportive of creativity.

Finally, as the workplace is facing a transformation from a physical workplace to virtual workstations due to the current outbreak of the Covid19 pandemic, the nature of the workplace has changed. In the current workplace, employees are more focusing on the use of technologies to perform their jobs. This requires managers to design social technologies which could revolve around changing demands of the workplace and facilitate social exchange processes and employee creativity.

Limitations

This study is not without limitations which highlight the need for future research. First, all of the samples were collected from developing region, which might limit the generalizability of the findings. Research has long realized that cultures vary among countries that might have a significant impact on how employees interact and perform their tasks (Bahadur et al., 2019; Ali et al., 2021b; Islam et al., 2021). Thus, our conclusion regarding the role of enterprise social media in enhancing employee creativity via LMX and SFI might not be generalizable to other cultural settings. Therefore, we invite scholars to investigate our model in Western culture for the generalizability of our findings.

Second, though, we used time-lagged data set in which the outcome variable is measured at the second phase of the survey. However, all the variables are self-reported which generates the possibility of common method bias. To further strengthen the results of this study, we invite future studies to use objective data regarding employee creativity (i.e., creativity rewards) to generate robust results.

Finally, future research should continue to extend the nomological network of social media usage. For example, although, we found that enterprise social media usage is positively related to employee creativity mediated by LMX and SFI, there is a negative impact of usage frequency on the indirect relationship between enterprise social media usage and employee creativity via LMX and SFI. This highlights the possibility that enterprise social media usage is not always positive, indeed in line with Yu et al. (2018) we found that more frequent use of enterprise social media has negative consequences. Yet, research is limited on to what degree enterprise social media usage is effective for employee creativity. This identifies that future research should use the diary method to understand when and to what degree use of enterprise social media might be beneficial to the employees.

CONCLUSION

In testing the theoretical model delineating the potential influence of enterprise social media on employee creativity. This study has been able to theoretically elaborate using social exchange theory that LMX and SFI are important mechanisms that transfer the influence of enterprise social media usage to employee creativity. Furthermore, empirical findings indicate that social media usage frequency by employees has a distinct effect on employee creativity via LMX and SFI. Thus, our findings set the stage for further research in understanding how enterprise social media usage by employees and leaders is affecting employees' creativity.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

ZW and MH: conception and design of study. AA: acquisition of data. ZW: analysis and interpreting data. ZW, AA, MH, and MG: drafting the manuscript. All authors made substantial contributions to the work reported in the manuscript.

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Why Do We "Like" on WeChat Moments: The Effects of Personality Traits and Content Characteristics

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To probe the motivational roles of hedonic gratification and social gratification in giving "Like" feedback on social media, we developed a set of novel pictures to simulate WeChat Moments. We subsequently examined how the personality trait of extraversion and stimulus content characteristics (e.g., emotional valence, personal relevance) influenced "Liking" behavior. A 2 (extraversion: extrovert group vs. introvert group) × 3 (emotional valence: positive vs. neutral vs. negative) × 2 (personal relevance: personally relevant vs. personally irrelevant)-mixed experimental design was applied to data obtained from 56 WeChat Moments users. These participants included 28 individuals with the highest extraversion scale scores (the extrovert group), and 28 individuals with the lowest extraversion scale scores (the introvert group), according to the NEO Five-Factor Inventory. Briefly, participants observed pictures on an interface similar to that of WeChat Moments and were given the option to "Like" each picture. "Like" rates and response time were then compared across groups and conditions by applying a mixed-design analysis of variance. Pearson's correlation coefficients were calculated to explore relationships between the "Like" rates under each condition and the scores for each personality trait. Compared with the neutral pictures, the positive and negative pictures were "Liked" more and less frequently, respectively ($F_{2,108} = 46.22$, $p < 0.001$). Compared with the poster-unrelated pictures, the personally related pictures were "Liked" more frequently ($F_{1,54} = 19.54$, $p < 0.001$). In the extrovert group, the frequency of "Likes" given to unrelated negative content positively associated with neuroticism ($r = 0.42$, $p = 0.025$) and negatively associated with conscientiousness ($r = -0.46$, $p = 0.014$). No correlations were observed in the introvert group. Compared with not giving "Like" feedback, participants gave "Likes" to positive and negative pictures more quickly ($p = 0.035$) and slowly ($p < 0.001$), respectively.These results support the hypothesis that hedonic gratification and social gratification motivate "Like" feedback for positive content and personally related content, respectively. "Liking" behavior was not affected by extraversion, but was related to neuroticism and conscientiousness. Content-related differences in time intervals for giving "Like" feedback in this study suggest that people do not hesitate to give "Like" feedback to positive content on WeChat Moments, yet linger in deciding to give "Like" feedback to negative content.

Keywords: social media, WeChat Moments, giving "Like" feedback, emotional valence, personal relevance, personality traits

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INTRODUCTION

With the booming development of social media platforms such as WeChat Moments, QQ Zone, Microblog, Facebook, Twitter, and Instagram, the "Like" button has become one of the easiest and most rapid response options to enable users to communicate through a single click. Consequently, the "Like" option has become immensely popular (Sumner et al., 2018). "Liking" behavior on social media platforms is also an important indicator of how users give feedback, obtain feedback, and make social comparisons. For example, on WeChat Moments (a popular social media platform in China, hereafter referred to as "Moments"), users can "Like" content posted by their friends without any implicit, ambiguous, or double-entendre implications. Users can also review "Like" feedback from their friends after posting content, and "Like" feedback from mutual friends after their friends post content. The number of "Likes" received from friends are readily observable below each post. Thus, "Liking" is standardized, visual, and quantifiable feedback, respectively. Compared with face-to-face or peer-to-peer social contact, "Liking" represents a novel type of communication.

To investigate why people provide "Like" feedback on social media, a number of studies have been conducted. Motivations for "Liking" behavior on social media have been discussed within the theoretical framework of uses and gratifications (U&G) (Kim, 2014; Hayes et al., 2016; Lee et al., 2016; Gan and Chunmei, 2017; Ozanne et al., 2017; Hossain et al., 2019; Shao and Kwon, 2019; Wang et al., 2019), which is a well-known and effective approach for understanding why and how people use media (Ruggiero, 2000). Previous studies have empirically validated the hypothesis that behavioral intentions of "Liking" are predicted by three aspects of gratification, hedonic, social, and utilitarian (Gan and Chunmei, 2017; Ozanne et al., 2017; Hossain et al., 2019). Hedonic gratification refers to enjoyment (Lee et al., 2016; Gan and Chunmei, 2017; Hossain et al., 2019; Shao and Kwon, 2019), entertainment (Kim, 2014; Ozanne et al., 2017), and passing time (Lee et al., 2016). Social gratification refers to social support (Hayes et al., 2016; Gan and Chunmei, 2017), interpersonal relationships (Lee et al., 2016), social interactions (Hossain et al., 2019), bonding (Ozanne et al., 2017), and socialization (Kim, 2014). Meanwhile, utilitarian gratification refers to seeking information (Kim, 2014; Gan and Chunmei, 2017; Ozanne et al., 2017; Hossain et al., 2019) and expression (Kim, 2014; Shao and Kwon, 2019). These factors have been proved as motivations which significantly predict "Liking" behavior either directly or indirectly based on intention, and this in turn decides "Liking" behavior (Shao and Kwon, 2019).

In addition to the U&G approach, scholars have considered other theories to account for factors that empirically influence "Liking" behavior on social media. Based on the theory of planned behavior (TPB), some studies have shown that relational facilitation, self-presentation, and metacommunication are key drivers of "Liking" activity on Facebook (Sumner et al., 2018; Dhir et al., 2019). By integrating guanxi theory and the affective response model, another study has indicated that guanxi cues (i.e., mianzi giving, renqing, and ganqing) positively and indirectly affect the intention of Chinese people to "Like" on the Moments platform (Zhao and Zhang, 2020). Since relational facilitation, self-presentation, metacommunication, and guanxi have also been examined in interpersonal relationships (Sumner et al., 2018; Dhir et al., 2019; Zhao and Zhang, 2020), it is consistent for these factors to be considered for their social value in influencing "Liking" behavior in social media.

It has been demonstrated that hedonic gratification, social gratification, and utilitarian gratification can motivate "Like" intentions (Chin et al., 2015; Sun et al., 2016; Dhir et al., 2019; Hossain et al., 2019; Shao and Kwon, 2019; Wang et al., 2019). According to TPB, individual behavior is influenced by behavioral intention (Ajzen, 1991). Consequently, the stronger the "Like" intention of users, the greater the chance that "Liking" behavior will be exhibited. However, it is important to note that "Like" intention does not universally lead to actual "Liking" behavior (Sun et al., 2016). In addition, given that an unobtrusive measure of actual "Liking" behavior is not obtainable, self-reporting data (Lee et al., 2016; Gan and Chunmei, 2017; Hossain et al., 2019; Shao and Kwon, 2019; Li and Wang, 2021) or information from interviews (Hayes et al., 2016; Ozanne et al., 2017) have been used to obtain individuals' recollections of past behaviors. Yet, while "Like" intentions have been used to predict past "Liking" behavior, it remains for actual "Liking" behavior to be investigated to reveal how gratifications drive actual "Liking" behavior on social media. Chin et al. (2015) conducted a field experiment to investigate the relationship between motivations and actual "Liking" behavior. They developed 32 different combinations of content posted on Facebook while controlling five variables: hedonic, utilitarian, affiliation, compliance, and conformity motivations. Each content posted on Facebook was displayed to participants, and the participants subsequently responded on survey forms. The resulted showed that the five motivations examined all had a positive impact on the participants' attitudes toward "Liking," which in turn had a positive impact on their "Like" intention. Furthermore, it was observed that "Like" intention had a positive impact on actual "Liking" behaviors (Chin et al., 2015).

The design of the field experiment described above provides a useful reference for investigations of the relationships between motivations and actual "Liking" behavior. However, there are two aspects that need to be considered in future studies. One is that Chin et al. (2015) used structural equation modeling to examine the relationships among five motivations, attitudes toward "Liking," "Like" intentions, and "Liking" behavior. However, it remains unknown whether these motivations represent independent variables that drive users to give or not give "Like" feedback on social media. The second aspect to consider is that utilitarian gratification was confused with hedonic gratification in the study by Chin et al. (2015), since four types of positive and negative narratives were designated as hedonic and utilitarian. Utilitarian gratification includes expression and information seeking as motivations of "Liking" behavior, and these can vary greatly among individuals. Consequently, it is not feasible to control utilitarian gratification as a variable of content posted on social media. Therefore, in the design of the present study, only hedonic gratification and social gratification were examined, with different types of simulated Moments content developed to address these two motivation variables.

It has been suggested that the motivations for using social media can vary according to individuals' personality traits (Papacharissi and Mendelson, 2011). However, to date, few studies have investigated the relationship between personality traits and "Liking" behavior on social media. Moreover, among the studies which have performed these investigations, their results are not consistent. For example, Kabadayi and Price (2014) observed that extraversion, neuroticism, and openness to experiences indirectly influenced "Liking" behavior. In another study, affective attitudes toward Facebook "Liking" were positively predicted by extraversion and agreeableness, while openness to experiences was a negative predictor (Lee et al., 2016). In a more recent study, agreeableness and conscientiousness, yet not extraversion, had positive and negative effects on "Liking" behavior, respectively (Li and Wang, 2021). In terms of social media use, extraversion has been associated with a greater number of Facebook friends (Tazghini and Siedlecki, 2013). Moreover, some studies have found that extraversion is the most significant personality trait predictor for use of social media (Wilson et al., 2010; Gosling et al., 2011). Extraversion describes a person's tendency to be sociable and his/her ability to experience positive emotions (Butt and Phillips, 2008). Thus, extraversion is related to both social gratification and hedonic gratification. In the present study, extraversion will be evaluated as a personality trait variable to examine whether extroverts or introverts exhibit greater "Liking" behavior on social media.

Previous studies have used questionnaires, interviews, and field experiments to investigate hedonic and social gratification as motivations of "Liking" behavior on social media. However, it remains unclear whether "Liking" behavior is related to extraversion as a personality trait. Moreover, to date, no experimental studies have strictly manipulated independent variables and controlled irrelevant variables to confirm the effects of extraversion, hedonic gratification, and social gratification on actual "Liking" behavior. Therefore, the aim of this study was to compare the responses of two groups of participants who received high (extrovert group) vs. low (introvert group) scores for the extraversion trait. Both groups were shown images of simulated Moments content that exhibited different emotional valences (positive vs. neutral vs. negative) and different personal relevance to the poster (personally relevant vs. personally irrelevant). The participants were given the option to "Like" or "No-like" the pictures. Similar to the field experiment study conducted by Chin et al. (2015), emotional valences were designed to represent hedonic gratification in the present study. Regarding social gratification, Chin et al. (2015), affiliation motivation was designated according to whether or not the posted content was related to the originators' daily lives or mood changes. Furthermore, estimates of the affiliation motivation of the participants were based on scoring of items such as, "the content of this post allows me to be informed about poster's living/mood/recent status" (Chin et al., 2015). Therefore, personal relevance to the poster was designed to represent social gratification in the present study. According to U&G theory and the results of previous studies, the following hypotheses were established for the present study. Hypothesis 1: Simulated positive images from Moments will receive more "Likes" than neutral and negative images. Hypothesis 2: Pictures accompanied by personally relevant captions will receive more "Likes" than pictures accompanied by personally irrelevant captions. Hypothesis 3: Participants in the extrovert group will "Like" simulated Moments images more often than participants in the introvert group.

METHODS

Participants

A total of 155 college students completed the NEO Five-Factor Inventory (Luo and Dai, 2011). Among these students, 28 were included in an extrovert group (3 males, 25 females), and 28 were included in an introvert group (4 males, 24 females). The two groups were age-matched (extrovert group: 19.00 ± 1.05 years old, introvert group: 19.39 ± 0.99 years old, $t_{54} = -1.44$, $p = 0.157$, Cohen's $d = 0.38$) and all of the participants exhibited normal or corrected visual acuity. Informed consent forms were collected from all of the participating students prior to the start of the experiment, and each received remuneration at the end of the experiment.

Stimuli and Tool

Images Simulating WeChat Moments

To simulate real WeChat Moments, the picture materials used in this study included screenshots of images from actual online Moments accounts. The images were subsequently processed so that each image consisted of a consistent cover picture, two WeChat avatars (viewer and poster), two nicknames (viewer and poster), an emotional picture, and a caption (**Figures 1A–D**). The emotional valence of each emotional picture (positive vs. neutral vs. negative) and the personal relevance of each poster's captions (personally relevant vs. personally irrelevant) were independent variables that were manipulated. To reduce interference from irrelevant stimuli, the cover of each simulated Moments image was set as a blue sky, while the avatars of the poster and viewer were represented as WeChat logos. The nicknames of the viewers were "My Moments" and the posters' were labeled, "Other's Moments." A total of 120 simulated Moments images were divided into two sets of 60 images each. The emotional pictures were repeated in both sets, but if one picture was paired with personally relevant captions in one set, it was paired with irrelevant captions in the other set. In each set, there were six conditions (positive-personally relevant, neutral-personally relevant, negative-personally relevant, positive-personally irrelevant, neutral-personally irrelevant, and negative-personally irrelevant), and each condition had 10 pictures. Half of the participants were shown one set of simulated Moments images, while the other half of the participants were shown the other set of simulated Moments images. Consequently, each picture was presented only once in the experiment.

Emotional Pictures

A total of 20 positive, 20 neutral, and 20 negative emotional pictures were selected from the Chinese Affective Picture System

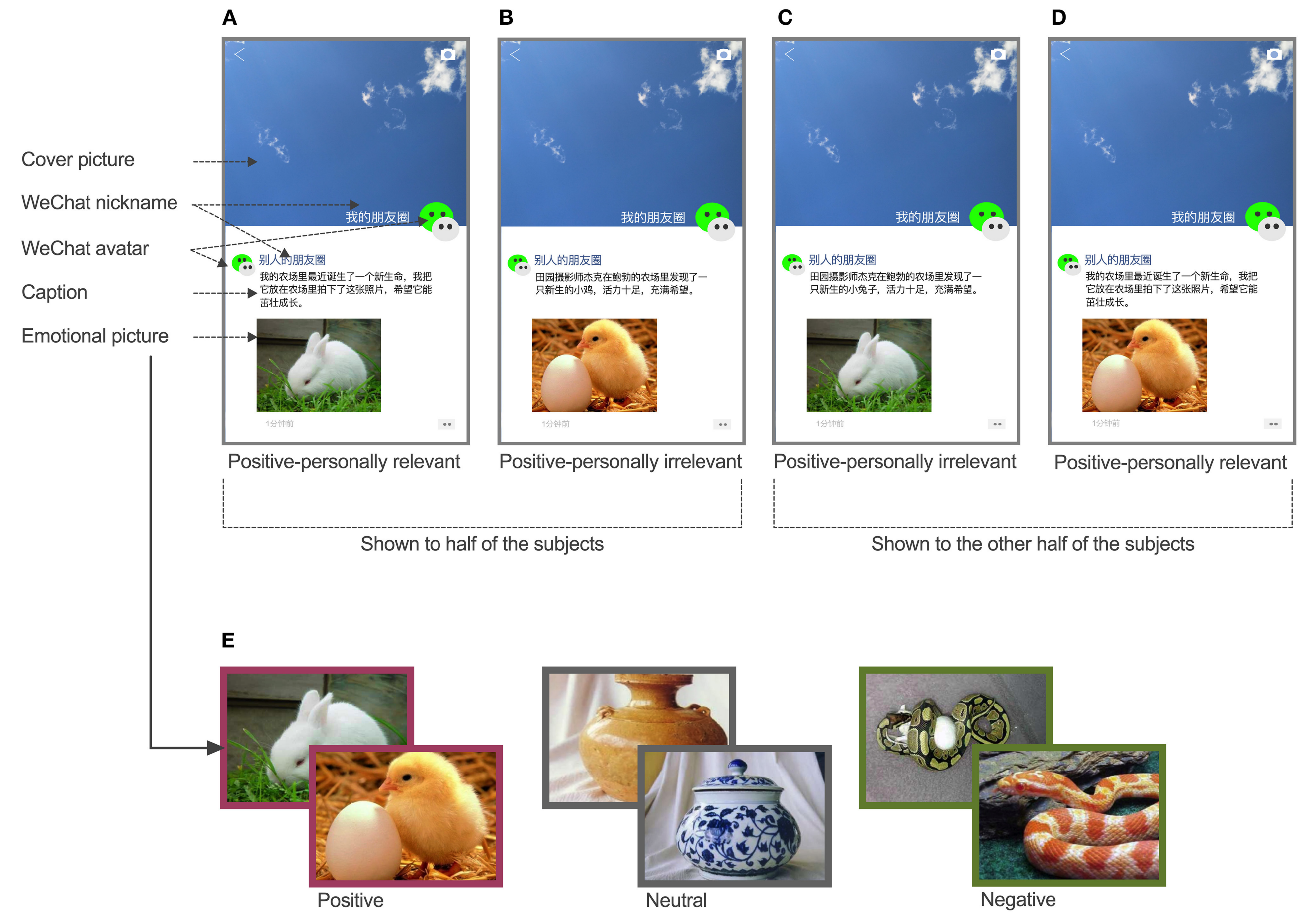

FIGURE 1 | Examples of simulated Moments images and emotional pictures. A pair of positive emotional pictures of similar situations were matched with two types of captions, personally relevant captions **(A,D)** or personally irrelevant captions **(B,C)**. Half of the participants in the extrovert and introvert groups were shown **(A)** and **(B)** during the experimental task, while the other half of the participants were shown **(C)** and **(D)**. **(E)** Examples of emotional pictures. Three sets of positive, neutral, and negative pictures, respectively. "我的朋友圈": "My Moments"; "别人的朋友圈": "Other's Moments"; **(A)**: "我的农场里最近诞生了一个新生命，我把它放在农场里拍下这张照片，希望它能茁壮成长。" ("A new life was born recently. I put it on my farm and took this picture. I hope it will thrive."); **(B)**: "田园摄影师杰克在鲍勃的农场里发现了一只新生的小鸡，活力十足，充满希望。" ("Jack, a field photographer, found a newborn chick on Bob's farm with great vigor and hope."); **(C)**: "田园摄影师杰克在鲍勃的农场里发现了一只新生的小兔子，活力十足，充满希望。" ("Jack, a field photographer, found a newborn rabbit on Bob's farm with great vigor and hope."); **(D)**: "我的农场里最近诞生了一个新生命，我把它放在农场里拍下了这张照片，希望它能茁壮成长。" ("A new life was born recently. I put it on my farm and took this picture. I hope it will thrive."). (Images retrieved with permission from: Chinese Affective Picture System).

(CAPS) database according to the emotional valence scores assigned to each (Bai et al., 2005). Each type of emotion contained 10 pairs of pictures representing similar situations, resulting in a total of 60 selected pictures. Representative pictures are shown in **Figure 1E**. Additional college students (10 males, 10 females; mean age: 20.60 ± 0.94 y) were recruited to score the emotional valence of the selected emotional pictures using a 9-point scale (1 = very negative, 5 = neutral, 9 = very positive). Significant differences were observed among the emotional valence scores received for the positive (7.14 ± 0.53), neutral (5.79 ± 0.47) and negative (2.81 ± 0.53) pictures ($F_{2,57} = 379.26, p < 0.001$, partial $\eta^2 = 0.93$).

Captions

Four college students wrote a personally relevant and a personally irrelevant caption for each emotional picture based on its content. The former were related to the poster's personal life and included the terms "I" or "my." In contrast, the latter were not related to the poster's personal life and included terms such as "others," "everyone," or others' names. For each pair of emotional pictures for similar situations, one was paired with a personally irrelevant caption, while the other was paired with a personally relevant caption. Both captions described the same topic. **Figures 1A–D**, show representative simulated Moments images of emotional pictures of a similar situation with personally relevant and personally irrelevant captions. Half of the participants in each of the extrovert and introvert groups were shown in **Figures 1A,B** in the formal experiment, while the other half of the two groups were shown in **Figures 1C,D** for the task.

NEO Five-Factor Inventory

The 60-item NEO Five-Factor Inventory (NEO-FFI) was previously compiled by Costa and McCrae (Costa and McCrae, 1992; Mccrae and Costa, 2004) to measure five basic personality factors: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Each scale includes 12 items for a total of 60 items. A Chinese translation of the NEO-FFI has been widely used (Luo and Dai, 2011). Cronbach's α coefficients for each scale among the Chinese college students were 0.77 for neuroticism, 0.78 for extraversion, 0.63 for openness, 0.72 for agreeableness, and 0.74 for conscientiousness (Yao and Liang, 2010).

Experimental Procedure

A mixed-design of 2 (extraversion: extrovert group vs. introvert group) × 3 (emotional valence of simulated Moments images: positive vs. neutral vs. negative) × 2 (poster's personal relevance: personally relevant vs. personally irrelevant) was used. Extraversion was the between-subjects variable, while emotional valence and personal relevance were within-subjects variables. "Like" rates and "Like"/"No-like" response times were dependent variables.

Questionnaire Testing and Screening

The NEO-FFI was completed by groups of participants before the formal experiment. A total of 155 valid questionnaires were collected. Scores for each of the five scales were calculated separately for each participant. For the formal experiment, the participants with the highest extraversion scale scores ($n = 30$) were included in an extrovert group, while participants with the lowest extraversion scale scores ($n = 30$) were included in an introvert group. Behavioral data for two participants in the extrovert group and two participants in the introvert group did not match with their questionnaire scores, so data from these four individuals were excluded from analysis. Consequently, a total of 28 participants in the extrovert group and 28 participants in the introvert group were included in the final analysis. The differences in extraversion scores between the two groups were very significant (extrovert group: 45.07 ± 2.60, introvert group: 31.07 ± 4.60, $t_{54} = 14.02$, $p < 0.001$, Cohen's $d = 3.75$).

Formal Experiment

The experiments were conducted in a quiet room and each participant performed their tasks individually. The experimental procedure was presented by E-prime 2.0 (Psychology Software Tools, Inc., Pittsburgh, PA, USA). Briefly, each participant was asked to respond with or without a "Like" keystroke to simulated Moments images presented on a screen. There was no requirement for the participants to respond as quickly as possible. After understanding the instructions, the participants pressed the space bar to start the experiment. Each trial started with a white "+" gaze point presented on a gray screen for 350 ms. This was followed by presentation of a simulated Moments image in the center of the gray screen. If the participant wanted to "Like" the image, they were instructed to press "F." If the participant did not want to "Like" the image, they were instructed to press "J." A blank gray screen was subsequently displayed for 1,500 ms before the next trial was started. A total of 60 trials were completed by each participant. At the end of the experiment, the purpose of the experiment was explained to each participant and they were asked to keep the experiment confidential.

Data Analysis

All statistical analyses were performed by using SPSS 19.0 (SPSS, Inc., Chicago, IL, USA). The independent samples t-test was used to compare age and extraversion scores between the extrovert and introvert groups. To compare the emotional valences of the emotional pictures, one-way analysis of variance (ANOVA) between subjects was performed.

The experiments conducted recorded whether the participants "Liked" the simulated Moments images presented, and when they "Liked" or "No-liked" the pictures. These data were subsequently analyzed. "Like" rate was equal to the number of trials "Liked" for a given condition divided by the total number of trials for that same condition. "Like"/"No-like" response time was also recorded and was defined as the time between presentation of a simulated Moments image and the reaction recorded by a participant. If a participant's "Like"/"No-like" rate was zero, then the participant's "Like"/"No-like" reaction time was calculated as the average of all the participants' "Like"/"No-like" response times under this condition.

"Like" rate data were entered into a 2 (extrovert vs. introvert groups) × 3 (positive vs. neutral vs. negative emotional valence) × 2 (personally relevant vs. personally irrelevant) mixed-design ANOVA, with repeated measures on the last two factors. Similarly, "Like"/"No-like" response times were entered into a 2 (extrovert vs. introvert groups) × 2 ("Like" vs. "No-like") × 3 (positive vs. neutral vs. negative emotional valence) × 2 (personally relevant vs. personally irrelevant) mixed-design ANOVA, with repeated measures on the last three factors. If the main effect (greater than or equal to three levels) or interaction effect of ANOVA was significant, a *post hoc* test or simple effect analysis was performed.

Pearson's correlations were computed to explore relationships between the "Like" rates and the scores for each dimension of the NEO-FFI. A Greenhouse-Geisser correction was applied to the ANOVA results when the data did not meet the spherical assumption, with the *df* value still reporting the result before correction. The effect size of ANOVA was reported by using partial eta squared (partial η^2). Cohen's d was used as a t-test effect measure. Bonferroni correction was used for both *post hoc* test and simple effects analyses. The significance level of the results was set at $p < 0.05$.

RESULTS

"Like" Rates

"Like" rates were determined for the six types of simulated Moments images presented to the extrovert and introvert groups in this study (**Figure 2A**). Three-factor ANOVA results demonstrate that the main effect of emotional valence was significant ($F_{2,108} = 46.22$, $p < 0.001$, partial $\eta^2 = 0.46$) (**Figure 2B**), indicating that the simulated Moments images with different emotional valences received different "Like" rates. The main effect of personal relevance was also significant ($F_{1,54} = 19.54$, $p < 0.001$, partial $\eta^2 = 0.27$) (**Figure 2C**), with the simulated Moments images with personally relevant captions receiving a higher "Like" rate than the pictures with captions without personal relevance. In contrast, neither the

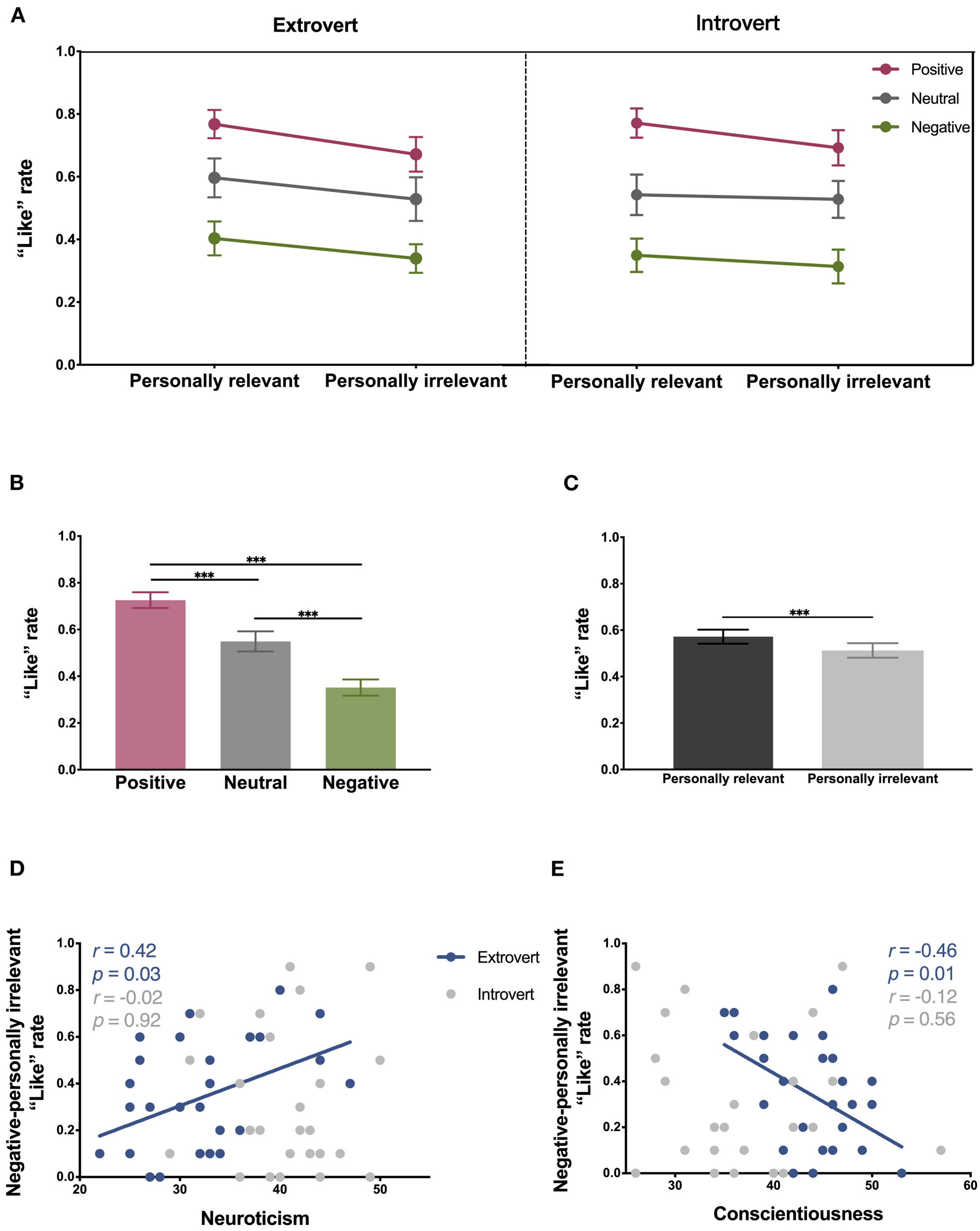

FIGURE 2 | "Like" rates and their correlation with personality traits. **(A)** "Like" rates for the extrovert and introvert groups for the six conditions examined: positive-personally relevant, neutral-personally relevant, negative-personally relevant, positive-personally irrelevant, neutral-personally irrelevant, and negative-personally irrelevant. Three-factor ANOVA results demonstrate that the main effect of emotional valence ($F_{2,108} = 46.22$, $p < 0.001$, partial $\eta^2 = 0.46$) and the main effect of personal relevance ($F_{1,54} = 19.54$, $p < 0.001$, partial $\eta^2 = 0.27$) were significant. **(B)** The main effect of emotional valence on "Like" rate (positive vs. neutral: Cohen's $d = 0.63$, positive vs. negative: Cohen's $d = 1.49$, neutral vs. negative: Cohen's $d = 0.69$). **(C)** The main effect of personal relevance on "Like" rate (relevance vs. irrelevance: Cohen's $d = 0.26$). **(D)** Correlations between "Like" rates and neuroticism scores for the negative-personally irrelevant condition. **(E)** Correlations between "Like" rates and conscientiousness scores for the negative-personally irrelevant condition. Error bars indicate standard errors. *** $p < 0.001$.

main effect of extraversion, nor the interaction effect, were significant (main effect of extraversion: $F_{1,54} = 0.09$, $p = 0.769$, partial $\eta^2 = 0.00$; interaction effect of extraversion × emotional valence: $F_{2,108} = 0.24$, $p = 0.786$, partial $\eta^2 = 0.00$; interaction effect of extraversion × personal relevance: $F_{1,54} = 1.53$, $p = 0.221$, partial $\eta^2 = 0.03$; interaction effect of emotional valence × personal relevance: $F_{2,108} = 1.11$, $p = 0.332$, partial $\eta^2 = 0.02$; interaction effect of extraversion × emotional valence × personal relevance: $F_{2,108} = 0.15$, $p = 0.857$, partial $\eta^2 = 0.00$). Thus, no difference in "Like" rate was observed between the extrovert and introvert groups.

A *post hoc* analysis of the main effect of emotional valence identified a significant difference in the "Like" rates of positive

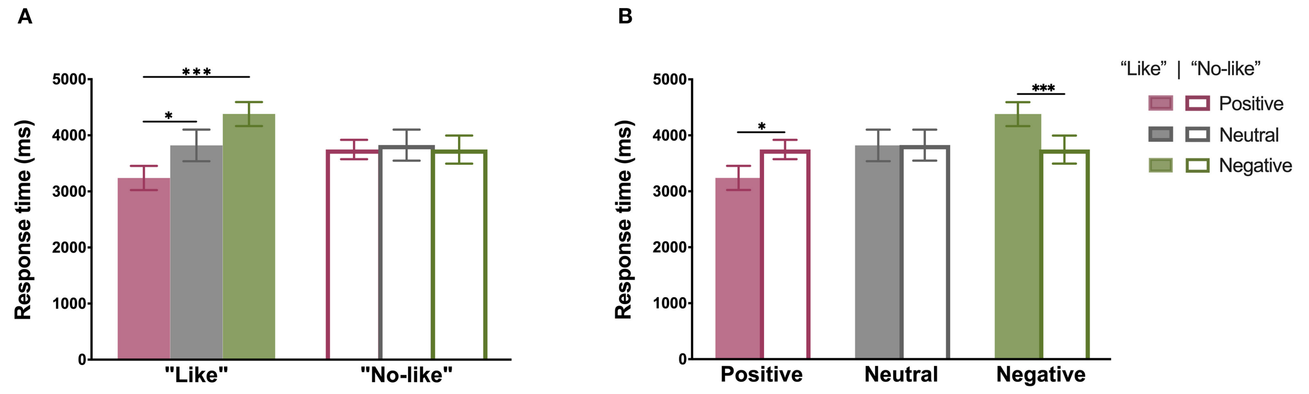

FIGURE 3 | "Like"/"No-like" response times. **(A)** Emotional valence of responses under "Like" vs. "No-like" conditions (positive vs. neutral: Cohen's $d = -0.31$, positive vs. negative: Cohen's $d = -0.71$). **(B)** "Like"/"No-like" effects for different emotional valence conditions (positive: "Like" vs. "No-like": Cohen's $d = -0.35$; negative: "Like" vs. "No-like": Cohen's $d = 0.36$). Error bars indicate standard errors. *$p < 0.05$; ***$p < 0.001$.

(0.73 ± 0.25), neutral (0.55 ± 0.32), and negative (0.35 ± 0.26) simulated Moments images ($ps < 0.001$, positive vs. neutral: Cohen's $d = 0.63$, positive vs. negative: Cohen's $d = 1.49$, neutral vs. negative: Cohen's $d = 0.69$) (**Figure 2B**). A pairwise comparison of the main effect of personal relevance also showed that the "Like" rates of the simulated Moments images of personal relevance (0.57 ± 0.23) were higher than those for the simulated Moments images of personal irrelevance (0.51 ± 0.23) ($p < 0.001$, Cohen's $d = 0.26$) (**Figure 2C**).

Correlation Between "Like" Rates and Personality Traits

Correlation coefficients between the "Like" rates of the six types of simulated Moments images and the scores from each dimension of the NEO-FFI were calculated. No significant correlations were observed when all of the participants were included in the correlation analysis ($ps > 0.05$). However, when the correlations were calculated separately for the extrovert and introvert groups, the "Like" rates in the extrovert group for the negative-personally irrelevant condition were found to positively correlate with neuroticism scores ($r = 0.42$, $p = 0.025$) (**Figure 2D**) and negatively correlate with conscientiousness scores ($r = -0.46$, $p = 0.014$) (**Figure 2E**). In contrast, no significant correlations were identified in the introvert group.

"Like"/"No-Like" Response Time

Participants in the extrovert and introvert groups responded to the six types of simulated Moments images with "Like" or "No-like" feedback. Four-factor ANOVA results showed that the main effect of emotional valence was significant ($F_{2,108} = 5.28$, $p = 0.007$, partial $\eta^2 = 0.09$). Thus, differences were observed in the duration of the participants' decisions to "Like" or "No-like" the simulated Moments images with different emotional valences. In particular, whether to "Like" $\times$ emotional valence interaction effect was significant ($F_{2,108} = 6.27$, $p = 0.003$, partial $\eta^2 = 0.10$). These results indicate that the duration of a participant's decision to "Like" the simulated Moments images that have different emotional valences differed from the duration of the decision to "No-like" those images. The emotional valence $\times$ personal relevance interaction effect was also found to be significant ($F_{2,108} = 3.41$, $p = 0.044$, partial $\eta^2 = 0.06$). The latter result indicates that the duration of the decision to give or not give "Like" feedback to the pictures with different emotional valences differed for the personally relevant vs. personally irrelevant conditions. No other main effect or interaction effects were observed ($ps > 0.05$).

An analysis of the simple effect of whether to "Like" $\times$ emotional valence interaction showed that when a participant chose to give "Like" feedback, the response time for positive pictures was shorter than that for the neutral pictures ($p = 0.036$, Cohen's $d = -0.31$) and for the negative pictures ($p < 0.001$, Cohen's $d = -0.71$). Conversely, when the participant chose not to give "Like" feedback, there was no difference in the response time to the positive, neutral, or negative pictures ($ps > 0.05$) (**Figure 3A**). We further observed that the time taken to "Like" the positive pictures was shorter than the time taken to "No-like" the positive pictures ($p = 0.035$, Cohen's $d = -0.35$). Conversely, the time taken to "Like" the negative pictures was longer than the time taken to "No-like" the negative pictures ($p < 0.001$, Cohen's $d = 0.36$). Meanwhile, there was no difference between the time taken to give, or not give, "Like" feedback to the neutral pictures ($p = 0.988$) (**Figure 3B**).

DISCUSSION

"Like" responses of the extrovert and introvert groups to simulated Moments images which had different emotional valences and personal relevance were compared. The Moments images that exhibited positive emotion received more "Likes" and that exhibited negative emotion received less "Likes" compared to the neutral emotion Moments images. In addition, the personally relevant Moments images received more "Likes" than the personally irrelevant Moments images. Meanwhile, the "Like" rates of the extrovert and introvert groups did not differ. However, in the extrovert group, the "Like" rate for the negative-personally irrelevant Moments images was found to positively correlate with neuroticism scores, yet negatively correlated with the conscientiousness scores. Finally, it took participants less time to "Like" the positive Moments images than to decide to not give a "Like." Conversely, the participants took less time to not click a "Like" for the negative Moments images than to click "Like." In contrast, there was no difference in the time taken to "Like" or "No-like" the neutral Moments images.

Hedonic gratification motivates individuals to experience positive affects (Meehl, 1975). Correspondingly, greater "Like" feedback was provided for the positive Moments images that were simulated in the present study. While positive emotional stimulation is generally related to hedonic gratification, there are differences. For example, hedonic gratification may be motivated in some individuals by neutral emotional stimulation of something they are interested in (such as a porcelain), or even by negative emotional stimulation (such as a horror film) (Martin, 2019). Functional magnetic resonance imaging (fMRI) has been used to scan the brains of participants when they "Like" photos posted by others on social media. It has been observed that their orbitofrontal cortex (OFC), insula, ventral tegmental area (VTA), striatum (including the pallidum), amygdala, hippocampus, and medial prefrontal cortex (mPFC) in the brain are activated (Sherman et al., 2018). These regions have also been shown to be implicated in the hedonic network (Alexander et al., 2021). Thus, whether "Liking" positive emotional stimulation or negative emotional stimulation, positive hedonic gratification may be experienced. Nevertheless, it is impossible to choose the content to post on Moments according to the personal characteristics of one viewer, either for a specific experimental condition or for an actual poster on Moments. That is why positive emotional images were simulated for this study and were used to detect hedonic gratification of "Liking" behavior in our cohort.

The emotional state of individuals browsing Moments images may be complex and dynamic. If real-time fluctuations in the emotions of a viewer could be monitored, it is anticipated that powerful evidence of hedonic gratification for "Liking" would be obtained. Recently, dynamic Affective Representation Mapping was demonstrated as a technique for measuring real-time fluctuations in emotions as the decision-process unfolds (Heffner et al., 2021). With this tool, the subjective experience of emotion can be precisely and mathematically mapped alongside "Liking" decisions made on social media in future study.

Social gratification of "Liking" behavior is complicated (Kim, 2014; Hayes et al., 2016; Lee et al., 2016; Gan and Chunmei, 2017; Ozanne et al., 2017; Hossain et al., 2019). In the present study, only the desire for interpersonal contact was considered. A multidimensional construct of affiliation motivation proposes that the desire for interpersonal contact is greater among individuals who especially value learning about others and exploring what others are like (Hill, 1987). As a result, the frequency of users sharing personal content has been found to have a direct effect on the frequency of "Likes" they receive from other users on social media (Bartsch et al., 2006; Marengo et al., 2021). In the present study, the participants provided "Like" feedback (as a type of interpersonal contact) for the simulated Moments images that were related to the posters. This result is consistent with a desire for interpersonal contact (namely, social gratification) to serve as a motivation of viewers' "Liking" behavior. Another study also observed that first-person narration alongside images (equivalent to personally relevant Moments images in the present study) gained more "Likes" because they boost a user's motivation to achieve social belonging (Chang et al., 2019). There are other social gratification factors to consider as well. For example, conformity motivation and subjective norms can affect viewers' attitudes to "Like," "Like" intention, and actual "Liking" behavior (Chin et al., 2015; Dhir et al., 2019; Hossain et al., 2019; Shao and Kwon, 2019). However, these factors are not reflected in the contents of the simulated posts used in the present study. Therefore, it remains for them to be addressed in future experiments.

Extraversion is related to both social gratification and hedonic gratification, since extraversion describes a person's tendency to be sociable and his/her ability to experience positive emotions (Butt and Phillips, 2008). Thus, it is not surprising that extraversion is related to "Liking" behavior on social media (Kabadayi and Price, 2014; Lee et al., 2016). However, similar to a previous study, we did not find a relationship between extraversion and "Liking" behavior (Li and Wang, 2021). A possible reason for this result is that both introverts and extroverts benefit from "Liking" behavior for different reasons. For example, introverts may build up their social relations with "Liking" behavior, while extroverts may provide "Like" feedback for social enhancement (Zywica and Danowski, 2008).

To simulate the actual response of users when they browse Moments, the participants in our study were not asked to respond as quickly as possible. Consequently, the time taken to make a "Like"/"No-like" choice was analyzed. It was observed that "Like" feedback was provided at a faster rate than "No-like" feedback for positive emotional content, and was slower for negative emotional content. Critical social cognitive processing that is responsible for this dissociation between "Liking" and "No-liking" behavior may involve the theory of mind (ToM). ToM is responsible for the comprehension and representation of other's beliefs, intentions, emotions, and feelings, and for predicting the behavior of others (Premack and Woodruff, 1978; Frith and Frith, 2006; Wu et al., 2020). When providing feedback to others, a user may think about how this specific poster may react upon receiving this feedback (Meshi et al., 2015). A poster, the mutual friends of a poster, and a viewer can check "Like" feedback that is provided. Thus, the viewer who clicks "Like" or "No-like" for a particular post may potentially infer the state of mind of the poster. For "Liking" positive contents, ToM may encompass an attractive force. However, ToM may encompass a repulsive force for "Like" feedback for negative content. It is possible that the task of "Liking" on Moments may represent an effective paradigm for detecting cognitive vs. affective ToM.

As mentioned above, the results of the present study provide further insight into possible reasons why viewers "Like" content on social media, with hedonic and social gratification identified as factors. The present results also suggest an effective paradigm to investigate cognitive vs. affective ToM. Regarding practical implications of the present study, a content strategy to attract more "Likes" on social media is demonstrated for both individuals and commercial users. A recent study demonstrated that the frequency of "Likes" received by others positively related with perceived happiness (Marengo et al., 2021). Conversely, feelings of exclusion have been reported when "Likes" are not received from close relations or socially superior network members (Hayes et al., 2018). For brand marketers, consumers' "Likes" can not only enhance brand connections and customer engagements, but can also positively affect online brand endorsement (Hoffman and Fodor, 2010; Malhotra et al., 2013; Bernritter et al., 2016). Overall, it is clear that individuals and commercial users should effectively present on social media to increase "Likes" received.

The current study has certain limitations which should be addressed in future research. First, the effect of hedonic and social gratification on "Liking" behavior on actual social media could be further investigated. It has been reported that the affective state in the Ultimatum Game is higher for unfair offers, and is associated with the rejection of unfair offers. More importantly, this pattern has only been observed for offers proposed by human conspecifics, not for offers generated by computers (van't Wout et al., 2006). In the present study, we attempted to simulate the details of Moments content as realistically as possible. However, our participants are presented with a computer that they know no one is behind. Consequently, their "Liking" behavior may not be the same as that on actual Moments. A second consideration is that additional studies should be conducted to test other factors that may influence "Liking" behavior from the perspective of hedonic and social gratification. For example, the effect of the number of "Likes" that a post has received and the influence of the relationship between the viewer and poster on "liking" behavior could be examined. Finally, a self-report measure of motivation for "Liking" behavior was not included in the present study because we felt that self-reports are uniquely ill-suited to the current research questions. However, it must be acknowledged that there are individual differences in hedonic and social gratification which motivate "Liking" behavior.

CONCLUSION

The results of the current study demonstrate that "Liking" behavior may be motivated by hedonic and social gratification. The present results also demonstrate effective content strategies for individual and commercial users to help attract a greater number of "Likes" on social media. In particular, content should have a positive emotional aspect and should be personally relevant.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Academic Committee of School of Education and Psychology, Southwest University for Nationalities. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

CZ: conceptualization, methodology, supervision, writing-original draft, writing-review & editing, re-constructing the theoretical framwork, re-writing introduction and discussion. XS: investigation, data curation, and writing-original draft. JL: formal analysis and writing-review & editing. TD, YC, and SY: resources and investigation. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

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The Nexuses Between Social Media Marketing Activities and Consumers' Engagement Behaviour: A Two-Wave Time-Lagged Study

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This study examined how social media marketing activities (SMMA) influence consumers' engagement behaviour in developing countries. Based on the stimulus-organism-response theory, we examined the effect of SMMA on consumers' engagement intention and further investigated the moderating effect of social media sales intensity. The study employed a time-lagged design with two waves to confirm the hypothesised framework. The study findings showed that SMMA positively influence consumers' engagement intention and engagement behaviour. In addition, social media sales intensity strengthens the link between engagement intention and engagement behaviour. This study adds to the literature on social media and discusses its practical implications.

Keywords: perceived social media marketing activities, engagement intention, social media sales intensity, engagement behaviour, stimulus-organism-response (SOR) framework

INTRODUCTION

Due to the embedment of technology across the marketing landscape, digital marketing has taken centre stage, resulting in an environment that is very engaging for customers, particularly on social media. Social media marketing is an effective digital marketing strategy that has introduced a new perspective to the current marketing arena. With the explosion of information and communication technology, the face of marketing activities changes as it increases the transformation of product and services in large volumes as compared with traditional marketing practices (Kautish and Rai, 2019). In the past, companies were not sure whether customers viewed or were influenced by their marketing efforts (Kautish and Sharma, 2018). The introduction of social media marketing activities (SMMA) provides a new platform for companies to seek huge target market attention. Social media has progressively become an integral part of our lives in terms of opinion, evaluation, and purchase of any product or service. Companies are moving toward SMMA to approach their specific targeted market with low cost and efficient medium as compared with traditional marketing activities. Globally, 3.78 billion social media users have been noted as of 2021 (Statista, 2021). At present, companies are investing more in these platforms to create a positive image among customers. As COVID-19 impacts the world, most companies are moving toward social media platforms and providing live updates through vlogs, photos, posts, and tweets of new products and services (Vázquez-Martínez et al., 2021). This is because people are confined to their houses due to lockdown and their movement is restricted.

A report published by Hootsuite (2021) stated that there are 4.20 billion active social media users out of the global 7.83 billion population; 81.5% of users searched online for a product or service to buy, 69.4% used a shopping app on a mobile phone, and 76.8% purchased a product online. In Pakistan, the total population is 223 million, of which 46 million are active social media users and 8% of consumers make online purchases. This trend signifies the researcher's interest in SMMA, preferences, electronic word-of-mouth (eWOM), and purchase decisions (Michaelidou et al., 2011). SMMA are used to make a rational decision; consumers use different SMMA to search for new features and offers generated by companies about the product or services. This is termed as social media information search (SMIS), which refers to the search for information about products or services before making a decision (Xiang and Gretzel, 2010). Social media is becoming a popular source of information (Kim et al., 2013). People use social media to gather information (Westerman et al., 2014). Along with traditional media, social media has been increasingly used for information seeking (Edwards et al., 2014). In this social media era, increased trends in information search, diversified platforms of communication, and dynamic channels of communication make it easy for the company to attract more people (Zhang et al., 2021). SMMA are defined as a "group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and allows the creation and exchange of user-generated content" (Kaplan and Haenlein, 2010, p. 61). Previously, companies invested a huge budget on marketing campaigns, but as SMMA were introduced, it decreased the cost and reached a large number of geographically dispersed consumers. Companies use SMMA to create awareness about their products and services and share their experiences about the product (Stephen, 2016). SMMA are also used to update consumers of new services or products (Pentina et al., 2018).

Social media has changed the way we interact, share, and communicate with others (Vardeman-Winter and Place, 2015; Gao et al., 2021; Mujahid and Mubarik, 2021; Wang et al., 2021). Social media is "flexible enough to match our social capabilities and new ways of coordinating group action" (Reitz, 2012, p. 43). Social media platforms such as YouTube, Facebook, Instagram, Twitter, and Pinterest have become the most trending platforms for attracting online consumers. This medium provides consumers with the power to share their experiences throughout the world (Kozinets et al., 2010). Companies use SMMA to achieve low-cost marketing objectives (Ajina, 2019). SMMA have become an important source of e-commerce, and they promote relationship building and interactivity among customers (Akman and Mishra, 2017). Social media is used to build and maintain relationships and engage customers in a new way (Toledano and Avidar, 2016). A growing number of companies are using online platforms for customer engagement and connection (Mathwick et al., 2008).

Escobar-Viera et al. (2021) stated that there is limited literature available on social media usage and engagement. An existing study stated that "social media should utilise strategically and take deliberate initiatives to motivate and empower customers to maximise their engagement value and yield superior marketing results" (Li et al., 2021, p. 4). According to the study by Sashi (2012, p. 260), engagement is about "turning on customers by building emotional bonds in relational exchanges with them." The interactive nature of SMMA establishes a close relationship between companies and customers (Dolan et al., 2019). Customer engagement is a crucial construct in online and social business environments (Brodie et al., 2013), which is linked with frequent interaction with the focal object (Thakur, 2018). This study guides the marketing managers and retail practitioners significantly to incorporate SMMA to engage the potential customers, which will impact the sales intensity. As more and more e-retail businesses are moving toward social media usage to approach prospects as it is cost-efficient and effective for their attention. At present, people spend substantial time on social media activities, thus e-retailers may engage online shoppers.

This study unfolds a few shortcomings related to SMMA. First, a plethora of research has explored SMMA in a variety of contexts (Kautish and Sharma, 2019; Khare and Kautish, 2020). There is a severe dearth of studies with mediating and moderation relationship of SMMA (Kautish et al., 2021a). SMMA needs to be studied in the context of online shopping B2C e-commerce websites (e.g., Facebook, Instagram, and WhatsApp), which are gaining popularity in today's emerging market (Kautish et al., 2021d). Second, SMMA are studied with reference to stimulus-organism-response (SOR) theory to investigate the relationship between SMMA and engagement (refer to **Figure 1**). Previously, SMMA was studied using the gratification theory (McGuire, 1974), which states that individuals' motivation for media utilisation is to satisfy their perceived needs and desires. Third, limited attention is paid in practice to SMMA (Charoensukmongkol and Sasatanun, 2017; Cao et al., 2021), SMIS, and engagement intention corresponds with their significance to practitioners. Fourth, this study examined the moderating effect of social media sales intensity on the relationship between engagement intention and engagement behaviour. This study is based on the exhaustive review of previous studies conducted in the field of online shopping B2C e-commerce websites (Akram et al., 2018; Abumalloh et al., 2020). As technology companies, such as Amazon, are adapting to their customer's specifications to explain the SMMA phenomenon (Kautish et al., 2021c). Cao et al. (2021) proposed customers engagement such as consumption, contribution, creation, and this facet was adapted in this study with SMMA (Kautish et al., 2022). This study attempts the moderating effects of social media sale intensity in the relationship between engagement intention and engagement behaviour. Additionally, Li et al. (2021) suggested that firms should use SMMA to engage online

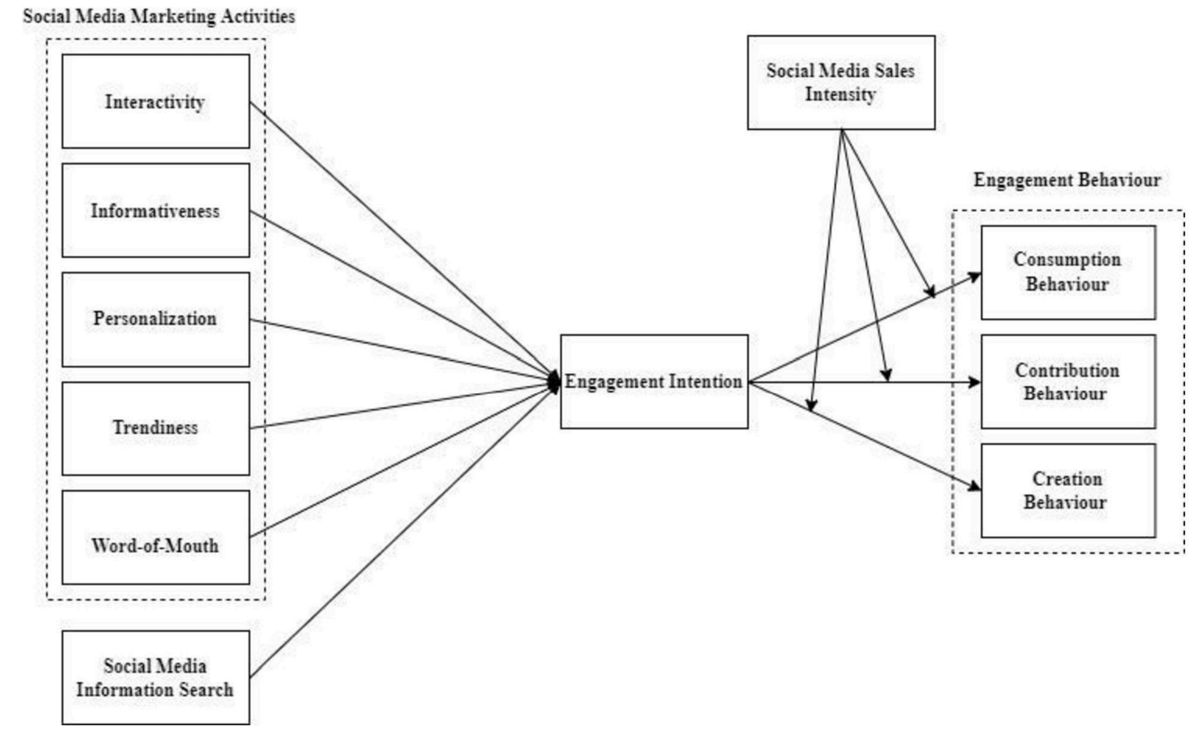

FIGURE 1 | Conceptual model of the study.

shoppers. Based on the previous recommendation and identified research gap, this study model is developed.

RELATED THEORY, LITERATURE REVIEW, AND RESEARCH HYPOTHESES

Stimulus-Organism-Response

Mehrabian and Russell (1974) originated the SOR model in 1974, and it stated that the environment as a stimulus (S) creates a set of signs of inner states, i.e., cognitive and affective reactions, and exhibits certain behaviours. In this study, perceived SMMA were used as stimuli. SOR stated that stimulus is an environment that consists of an internal evaluation of someone (O) and produces a response (R). The aim of the SOR model was to explain behavioural outcomes (consequences) in terms of internal cognitive and affective outcomes (of organisms) in certain environments (stimuli) (Chan et al., 2017). In this situation, engagement intention is termed as an inner state of customers or organisms (O) and may be categorised as an emotional state that occurs as a response to the stimulus. The response is the outcome based on the internal evaluation (O). In this study, engagement behaviour is the response; it is commonly observed that online social media evokes consumers' emotions and affects their behaviour (Manganari et al., 2009). Here, SMMA are termed as a stimulus. SMMA are defined as "a process by which companies create, communicate, and deliver online marketing offerings *via* social media platforms to build and maintain relationships with stakeholders that enhance value to stakeholders by facilitating interaction, sharing information, offering personalised purchase recommendations about existing and trending products and services" (Yadav and Rahman, 2018, p. 3884). The characteristics of an e-commerce environment in which customers interact are categorised as stimuli (Eroglu et al., 2003). Emotional and cognitive states include their experiences, assessments, and insights (Gao and Bai, 2014), and responses symbolise the behaviour. Following the review of the literature, we will focus our attention on the factors that are related to SMMA, such as engagement intention, social media sales intensity, and engagement behaviour.

Hypotheses Development

Social Media Marketing Activities and Engagement Intention

Social media marketing is defined as "a broad category of advertising spending, including advertising using the social network, virtual worlds, user-generated product reviews, blogger endorsement, RSS feeds of content and social news sites, podcasts, games, and consumer-generated advertising" (Bilgin, 2018, p. 129). Social media marketing platforms are linked to specific target consumers and strategies (Wibowo et al., 2020). SMMA resulted in both positive and negative outcomes. As a positive outcome, it generates customer retention and increases purchase intention (Hanaysha, 2018).

Interactivity is defined as "the extent to which e-commerce's social media facilitates customers to share content and views with the company and other customers" (Ibrahim et al., 2020, p. 558).

It is basically customer-generated content (Daugherty et al., 2008) and provides a platform for customers to share helpful content and crucial ideas about the product or services (Godey et al., 2016; Kautish and Rai, 2019). Interactive messages give the impression that companies are listening and responding (Bozkurt et al., 2021). The interactivity of social media empowers consumers to engage with companies and make decisions (Loureiro et al., 2019). Interactive stimuli involve a two-way communication and enhance customer engagement (France et al., 2016). Thus, the following hypothesis is proposed:

H1: Interactivity is positively related to engagement intention.

Informativeness is defined as the accuracy, comprehensiveness, and utility of the information a customer receives on social media. On social media, customers engage in e-shopping when they perceive that information about the product or service is accurate and sufficient to make a decision (Yadav and Rahman, 2018). This experience facilitates a favourable attitude toward the site (Elliott and Speck, 2005). Various e-commerce websites are easily evaluated on social media, and customers make the best choice (Aladwani and Palvia, 2002). This information stimulates consumer exposure and attention to predict engagement (Shareef et al., 2019). Informativeness stimulates conversation and reinforcement. Informative brand messages drive valuable customer engagement (Ul Islam and Rahman, 2017). Therefore, the following hypothesis is proposed:

H2: Informativeness is positively linked with engagement intention.

Personalisation refers to how social media is customised according to customer preferences (Koay et al., 2020; Kautish et al., 2021b). Customers share more individual experiences with social media (Martin and Todorov, 2010). Excessive information is available to customers' personalisation in social media, scanning the information, and providing decision quality and superior e-shopping experience (Tam and Ho, 2006). Thus, we postulate that:

H3: Personalisation is positively linked with engagement intention.

Trendiness is defined as a particular social media dimension where customers perceive offers with more trendy content (Ebrahim, 2020). Social media trendiness has four main motivations: knowledge, surveillance, pre-purchase information, and inspiration (Voorveld et al., 2018). According to Muntinga et al. (2011), surveillance refers to keeping people informed about their surroundings, knowledge about the company's product or services from other customers' awareness and proficiency; pre-purchase mentions as product or services review, rating the recommendation from other customers to make a well-informed purchase decision, and acquiring as company relevant information and attaining innovation ideas. This trendy SMMA dimension informed customers about the latest fashion and stimulus engagement and facilitated better decisions (Godey et al., 2016; Kautish and Rai, 2018; Djafarova and Trofimenko, 2019). This stimulates customers' sense of uniqueness and style to increase engagement (Ajitha and Sivakumar, 2019). Hence, the following hypothesis is proposed:

H4: Trendiness is positively linked with engagement intention.

Word-of-mouth (WOM) is the process of sharing and recommending the value of the experience of products and services on social media (Barreto, 2014). Berger (2014) focussed on WOM for the ownership, use, or features of a product or its seller. At present, WOM is replaced with e-WOM, as previews related to products and services are available online. WOM increases the widespread use of e-commerce and marketing (Yadav and Rahman, 2018). WOM increases customer satisfaction and reduces perceived risk (Park and Kim, 2008). Therefore, the following hypothesis is proposed:

H5: WOM is positively linked with engagement intention.

Social Media Information Search and Engagement Intention

Highly motivated customers spend more time searching for information about the product or services they want to purchase (Hwang et al., 2020). Information search refers to exploring different sources before making a purchase decision (Lim and An, 2021). Engagement is defined as the emotional connection between customers and a company (Dessart et al., 2015). The key element of engagement is the exchange of information between customers, and today's companies are getting the advantage of using social media to engage in this activity (Erat et al., 2006). Trainor et al. (2014) stated that there are positive relationships between social media and the financial and non-financial performances of an organisation. Companies targeting customers using social media generate an intensive sale through it. Companies are also facing tough competition with other companies selling similar products or services (Charoensukmongkol and Sasatanun, 2017). SMMA categorise outcomes in communication, information processing, sales, and social responses (Ashley and Tuten, 2015). Rodriguez et al. (2014) stated that social media increases the sales performance of an organisation. Therefore, the following hypothesis is proposed:

H6: SMIS is positively linked with engagement intention.

Engagement is defined as the psychological state of mind. Engagement behaviour is operationalised into three dimensions, namely, consumption, contribution, and creation. Consumption engagement behaviour refers to the media created by the user and the firm. It represents the minimum level of engagement and the users consume it passively. Consumption mainly occurs through reading (Shao, 2009). Bolton et al. (2013) stated that consumption covers playing, searching, and assuming that the user reads these contents during a search. Contributions refer to a higher level of engagement, including peer-to-content and peer-to-peer interactions on social media. Creation refers to a higher level of engagement and is generated by the consumer and displayed on social media (Schivinski et al., 2016). Keller

(2016, p. 11) defined engagement behaviour as "how different customers may want different relationships with a brand." There were three types of users in this category; first, followers who read the content of the social media website (Zhu and Chen, 2015); second, opportunists who retrieve marginal information, such as recipes; third, functionalists who focus on information (de Valck et al., 2009). Thus, the following hypotheses are proposed:

> **H7:** Engagement intention positively links with consumption engagement behaviour.

> **H8:** Engagement intention positively links with contribution engagement behaviour.

> **H9:** Engagement intention positively links with creation engagement behaviour.

The Moderating Role of Social Media Sales Intensity

People engaged in SMMA may feel the importance of this in increasing firm sales. The advantage of using SMMA for companies is that they increase the sales volume of products and services as compared with physical stores (Charoensukmongkol and Sasatanun, 2017). To increase sales using social media, companies should target specific customers. If the company uses SMMA more effectively, it may engage in the behaviour. SMMA used in the best way helps the company achieve differentiation and acquire more sales compared with companies that do not use social media. Companies that use SMMA to boost sales and provide superior services to customers are considered the best (Ainin et al., 2015). Using social media to increase companies' sales is more dominant in companies with high IT intensity than in those with low IT intensity (Ravichandran et al., 2005; Zhu and Chen, 2015; Mehmood and Hussain, 2017a,b; Mehmood et al., 2021a). When consumers rate a product or service online, it influences sales (Chevalier and Mayzlin, 2006). Social media is more effective in terms of sales than cost (Dinner et al., 2014). As social media targets more consumers and engages them through the options of sharing, liking, and commenting, they influence purchase decisions and sales (Atsmon et al., 2012). Companies use technology to engage customers and increase sales (Eisingerich et al., 2019).

Li et al. (2021) proposed that the use of social media by firms increases or stimulates sales. Järvinen and Taiminen (2016) suggested that SMMA should be integrated with sales departments to gain insight into how to engage customers and synergise their efforts. Utilising social media content to attract customers increases their engagement behaviour and boosts the sales of products or services (Malthouse et al., 2013). Various authors (Algharabat et al., 2018; Kapoor et al., 2018; Kaur et al., 2018; Dwivedi et al., 2021) have argued that firms use social media to engage with their customers by creating positive attitudes toward products or services, getting feedback, improving brand awareness, and increasing sales. Most companies use social media to connect with existing and new customers to create awareness about brands and images and to increase sales (Choi et al., 2016; Yadav and Rahman, 2016; Kunja and GVRK, 2018). Hence, it can be concluded that social media sales moderate the positive link between engagement intention and engagement behaviour. Thus, the following hypotheses are proposed:

> **H10:** Social media sales intensity intensifies the predictive influence of engagement intention on contribution behaviour in such a way that as social media sales intensity increases; this association will become stronger.

> **H11:** Social media sales intensity intensifies the predictive influence of engagement intention on consumption behaviour in such a way that as social media sales intensity increases; this association will become stronger.

> **H12:** Social media sales intensity intensifies the predictive influence of engagement intention on creation behaviour in such a way that as social media sales intensity increases; this association will become stronger.

MATERIALS AND METHODS

Data Collection

Data from Hootsuite (2021) reported 61.34 million internet users in Pakistan by the end of January 2021, with an increase of approximately 21% from 2020 to 2021. Annually, a 24.3% (9 million) change was observed in social media users. It was reported that 40 million audience reports on Facebook, 11 million on Instagram, and 2.1 million on Twitter. The importance of SMMA can be judged by highlighting the statistics of US$25.85 million spent on digital advertisements in 2020. The data for this study were gathered purposively from Pakistan. To achieve the objectives of this study, the unit of analysis was regular social media users, such as Facebook, Instagram, and Twitter, who purchase online products based on the reviews or ratings *via* SMMA, following the previous studies (Yadav and Rahman, 2018; Feng et al., 2021). As many potential customers check the reviews and ratings of the previous buyers. For this study, all consumer products are taken into account like cosmetics, shoes, bags, clothes, kitchen items, and watches. There is a clear advantage of the SMMA as people can easily evaluate the available options through ratings and reviews given by the previous customers on e-commerce websites. Before the commencement of the formal investigation, respondents were assured that their involvement would be completely confidential, and they would get PKR 300 as a reward for their participation.

In this study, data were collected at two-time intervals using the time-lagged approach. Two waves of data collection were undertaken at 2-month intervals to reduce common method bias (Podsakoff et al., 2003; Begum et al., 2020; Khan, 2021a,b; Khan et al., 2021; Ullah et al., 2021; Yu et al., 2021). A total of 800 people were surveyed in the first wave (T_1) of the study. A total of 660 questionnaires were completed and returned with a response rate of 82.5%. Participants were requested to report their perception of SMMA, SMIS, engagement intention, and social media sales intensity and provide their demographic information. A total of 660 respondents were asked to report their engagement behaviour in a second-wave survey (T_2), which took place

2 months later. The number of usable responses returned was 396 with a response rate of 60%. The study sample comprised 206 (52.0%) men and 190 (48.5%) women. The respondents' average age was 27 years, 22.7% had a bachelor's degree, and 51.8% had a master's degree. The average income of the respondents was approximately PKR 500,000.

Measures

For the research constructs and demographic variables, the questionnaires employed scales adapted from previous studies. The Likert scale ranged from 1 to 5, with 1 denoting "strongly disagree" and 5 denoting "strongly agree." A back-translation approach was used to convert the original English questionnaire into Urdu (Brislin, 1980; Mehmood and Li, 2018; Khan et al., 2020; Khan, 2021c; Khan and Khan, 2021). To measure perceived SMMA, interactivity (α = 0.957); sample item of this scale was "The social media allows me to share and update the existing content," informativeness (α = 0.901); sample item of this scale was "The social media offers accurate information on products," personalisation (α = 0.923); sample item of this scale was "The social media facilitates personalised information search," trendiness (α = 0.942); sample item of this scale was "Contents visible on the social media is the latest trend," and word-of-mouth (α = 0.960); sample item of this scale was "I would recommend my friends to visit the social media," a 3-item scale for each was used, drawn from Yadav and Rahman (2018). To measure SMIS (α = 0.919), we used a 3-item scale developed by Javed et al. (2020). The sample item of this scale was "I think social media sites help to search credible, and reliable information for making rational decisions." We used a four-item scale developed by Taylor and Todd (1995) to measure engagement intention (α = 0.922), and later applied by Cao et al. (2021); sample item of this scale was "I will not hesitate to engage with social media marketing for information or communication with people." An eight-item scale was used to measure social media sales intensity (α = 0.954), adapted from Charoensukmongkol and Sasatanun (2017). To assess engagement behaviour, consumption behaviour (α = 0.826); sample item was "I followed a poster/picture/graphics related to the product," contribution behaviour (α = 0.922); sample item was "I recommended online products," and creation behaviour (α = 0.939); sample item was "I initiated a discussion related to the online product," 4-item scale for each was adapted from Schivinski et al. (2016).

RESULTS

Descriptive Statistics and Confirmatory Factor Analysis

Before analysing the data, the assumptions for both univariate and multivariate were checked. All studied variables were examined for missing values, outliers, homoscedasticity, normality, and multicollinearity. The dataset's skewness and kurtosis values show that it is normally distributed. It was determined that the linearity and multicollinearity analysis scales are between −1.89 and +0.392, respectively. Multicollinearities were examined in this study by VIF (i.e., variance inflation factor) performed by SPSS 24.0. All values of the VIFs are below the threshold value of 10 (Hair et al., 2010), hence there is no multicollinearity concern in our study. Therefore, these results established that the dataset is appropriate for the regression analysis. **Table 1** shows the internal reliabilities of the predictors and outcome variables including means and standard deviations. Correlations between the study's variables are compatible and give preliminary evidence for hypothesis testing. We conducted a confirmatory factor analysis (CFA) by utilising AMOS 24.0 of the studied variables in accordance with Anderson and Gerbing's (1988). To examine convergent and discriminant validity, Hu and Bentler's (1999) cut-off criteria (i.e., χ^2/df less than 2, CFI greater than 0.90, and RMSEA less than 0.07) were utilised. To establish the data's validity, we used CFA on individual-level data with multiple item variables. The findings of the CFA analysis are shown in **Table 2**. When compared to other models, the baseline model test results revealed that the 11 factor had a satisfactory match with the data (χ^2/df = 1,116.324/685 = 1.630; CFI = 0.969; TLI = 0.964; and RMSEA = 0.040). The factor loadings (λ = with cut-off criterion more than 0.60 and $p < 0.001$) were all greater than 0.610, as shown in **Table 3**, and all items examined demonstrated significant loadings on their related factors. We also evaluated AVE (cut-off criterion >0.50) and CR (cut-off criterion >0.80), both of which confirmed convergent validity (**Table 3**). As a result, the suggested model was found appropriate for hypothesis testing.

Structural Model and Hypothesis Testing

We employed the structural equation model (SEM) technique to analyse the conceptual model, which has been extensively used in previous studies (Mehmood et al., 2019; Shang et al., 2021; Albloushi et al., 2022). The suggested model has a good fit, according to the fit indices (χ^2/df = 877.475/158 = 1.694, CFI = 0.968, TLI = 0.965, and RMSEA = 0.042). As exhibited in **Figure 2**, interactivity is positively related to engagement intention (β = 0.152, t = 3.140, $p < 0.01$), which confirms H1. According to the path analysis, informativeness significantly influences engagement intention (β = 0.185, t = 4.541, $p < 0.01$), which confirms H2. H3 proposed that personalisation significantly influences engagement intentions. The path analysis revealed that personalisation significantly influences engagement intention (β = 0.102, t = 2.130, $p < 0.05$), which confirms H3. H4 proposed that trendiness significantly influences engagement intentions. The path analysis revealed that trendiness significantly influences engagement intention (β = 0.128, t = 2.542, $p < 0.05$), which confirms H4. H5 proposed that WOM significantly influences engagement intentions. The path analysis reveals that WOM significantly influences engagement intention (β = 0.192, t = 2.943, $p < 0.05$), which confirms H5. H6 proposed that SMISs significantly influence engagement intentions. The path analysis reveals that SMIS significantly influences engagement intention (β = 0.413, t = 7.639, $p < 0.0001$), which confirms H6.

Hypothesis 7 proposed that engagement intention significantly influences consumption behaviour. According to the path analysis (**Figure 2**), engagement intention significantly influences consumption behaviour (β = 0.292,

TABLE 1 | Descriptive statistics, reliabilities, and correlation matrix.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Interactivity	3.303	1.443	(0.957)										
2. Informativeness	3.008	1.400	0.338**	(0.901)									
3. Personalisation	2.888	1.369	0.024	0.040	(0.923)								
4. Trendiness	2.984	1.462	0.022	0.016	0.019	(0.942)							
5. Word-of-mouth	3.388	1.406	0.039	0.004	0.169**	0.025	(0.960)						
6. Social media information search	2.893	1.398	0.354**	0.128*	0.002	0.047	0.013	(0.919)					
7. Engagement intention	3.701	1.290	0.101*	0.104*	0.112*	0.121*	0.103*	0.357**	(0.922)				
8. Social media sales intensity	3.074	1.517	0.167**	0.014	0.012	0.098	0.003	0.435**	0.269**	(0.954)			
9. Consumption behaviour	4.060	0.710	0.078	0.079	0.010	0.055	0.059	0.129*	0.220**	0.337**	(0.826)		
10. Contribution behaviour	2.715	1.127	0.158**	0.084	0.102*	0.121*	0.033	0.063	0.141**	0.102*	0.089	(0.922)	
11. Creation behaviour	3.669	1.111	0.071	0.055	0.004	0.022	0.032	0.047	0.108*	0.212**	0.338**	0.027	(0.939)

***p < 0.01, *p < 0.05; N = 396; Cronbach's α values are displayed along diagonal.*

TABLE 2 | Confirmatory factor analysis.

Model	χ^2	*df*	χ^2/df	$\Delta\chi^2$ (Δdf)	TLI	CFI	RMSEA
Eleven-factor model: baseline model	1,116.324	685	1.630		0.964	0.969	0.040
Ten-factor model: combining SMIS, CTB, and CRB	4,094.170	738	5.547	2,977.846 (53)	0.743	0.756	0.107
Nine-factor model: combining SMSI, COB, CTB, and CRB	4,659.943	738	6.314	3,543.619 (53)	0.700	0.715	0.116
Eight-factor model: combining INT, INF, PER, TRE, WOM, and SMIS	6,250.668	738	8.469	5,134.344 (53)	0.578	0.600	0.137
Seven-factor model: combining INT, INF, PER, TRE, WOM, and EI	6,705.940	738	9.086	5,589.616 (53)	0.543	0.567	0.143
Six-factor model: combining EI, SMSI, COB, CTB, and CRB	6,727.182	738	9.115	5,610.858 (53)	0.542	0.565	0.143
Five-factor model: combining PER, TRE, WOM, SMSI, EI, and COB	8,064.542	738	10.927	6,948.2158 (53)	0.439	0.468	0.158
Four-factor model: combining TRE, WOM, SMSI, EI, COB, and CTB	8,102.399	739	10.964	6,986.075 (54)	0.436	0.465	0.159
Three-factor model: combining WOM, SMSI, EI, COB, CTB, and CRB	8,218.518	739	11.121	7,102.194 (54)	0.427	0.457	0.160
Two-factor model: combining INF, PER, TRE, WOM, SMSI, and EI	8,450.006	739	11.434	4,333.682 (54)	0.410	0.440	0.162
One-factor model: combining all into one factor	12,809.636	741	17.286	11,693.312 (56)	0.176	0.123	0.203

INT, interactivity; INF, informativeness; PER, personalisation; TRE, trendiness; WOM, word-of-mouth; SMIS, social media information search; EI, engagement intention; SMSI, social media sales intensity; COB, consumption behaviour; CTB, contribution behaviour; CRB, creation behaviour; TLI, Tucker-Lewis's index; CFI, comparative fit index; RMSEA, root-mean-square error of approximation.

TABLE 3 | Variable's reliabilities and convergent validity.

Variables	Items code	λ	CR	AVE
Interactivity (INT), (Time-1)	INT1–INT3	0.917–0.951	0.957	0.882
Informativeness (INF), (Time-1)	INF1–INF3	0.810–0.924	0.902	0.755
Personalisation (PER), (Time-1)	PER1–PER3	0.848–0.930	0.924	0.803
Trendiness (TRE), (Time-1)	TRE1–TRE3	0.880–0.946	0.943	0.846
Word-of-mouth (WOM), (Time-1)	WOM1–WOM3	0.942–0.949	0.960	0.889
Social media information search (SMIS), (Time-1)	SMIS1–SMIS3	0.854–0.909	0.919	0.791
Engagement intention (EI), (Time-1)	EI1–EI4	0.825–0.885	0.923	0.750
Social media sales intensity (SMSI), (Time-1)	SMSI1–SMSI8	0.839–0.930	0.954	0.777
Consumption behaviour (COB), (Time-2)	COB1–COB4	0.610–0.851	0.830	0.553
Contribution behaviour (CTB), (Time-2)	CTB1–CTB4	0.835–0.913	0.922	0.748
Creation behaviour (CRB), (Time-2)	CRB1–CRB4	0.857–0.922	0.939	0.795

All factor loadings are significant at (p < 0.001), N = 396; λ, factor loadings. AVE, average variance extracted; CR, composite reliabilities.

$t = 4.427$, $p < 0.0001$), which confirms H7. As exhibited in **Figure 2**, engagement intention significantly influences contribution behaviour ($\beta = 0.150$, $t = 2.798$, $p < 0.01$), which confirms H8. As shown in **Figure 2**, engagement intention significantly influences creation behaviour ($\beta = 0.387$, $t = 6.836$, $p < 0.0001$), confirming H9.

Hypothesis 10 anticipated that at higher levels of social media sales intensity, the positive link between engagement intention and consumers' consumption behaviour will be stronger. As shown in **Figure 2**, the interaction between engagement intention and social media sales intensity predicted consumers' consumption behaviour significantly ($\beta = 0.265$, $t = 4.222$, $p < 0.01$), which supports H10. Furthermore, we plotted the interaction in accordance with Aiken and West's (1991) and **Figure 3** indicates that higher levels of social media sales intensity, the link between engagement

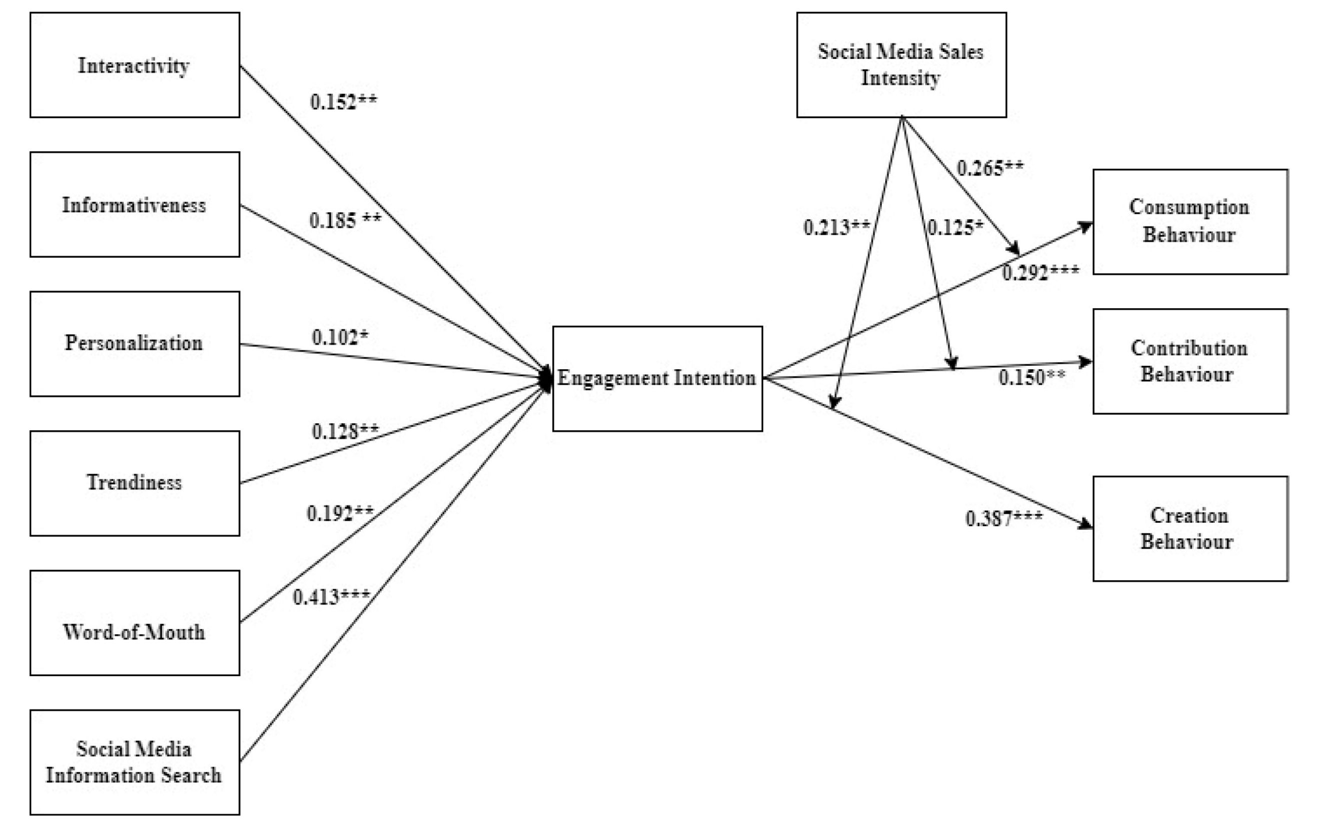

FIGURE 2 | Path analysis results; ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

intention and consumers' consumption behaviour grows stronger, confirming H10.

Hypothesis 11 anticipated that at higher levels of social media sales intensity, the positive association between engagement intention and consumers' contribution behaviour will be stronger. As shown in **Figure 2**, the interaction between engagement intention and social media sales intensity predicted consumers' contribution behaviour significantly ($\beta = 0.125$, $t = 2.280$, $p < 0.05$), which supports H11. We also plotted the interaction in accordance with Aiken and West's (1991) and **Figure 4** indicates that higher levels of social media sales intensity, the association among engagement intention, and consumers' contribution behaviour grows stronger, confirming H11.

Hypothesis 12 anticipated that at higher levels of social media sales intensity, the positive association between engagement

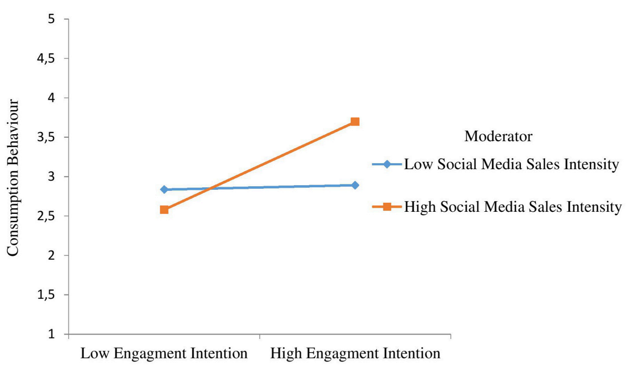

FIGURE 3 | Interactive effects of engagement intention and social media sales intensity on consumption behaviour.

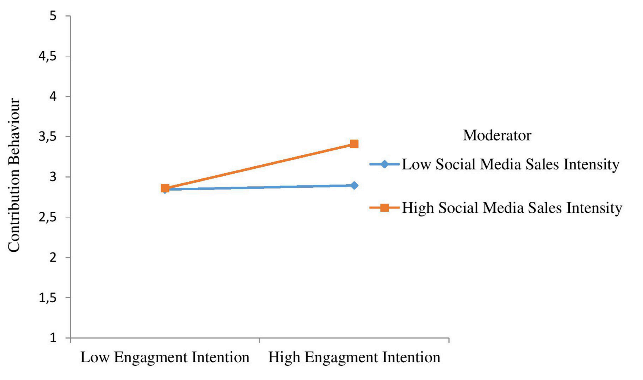

FIGURE 4 | Interactive effects of engagement intention and social media sales intensity on contribution behaviour.

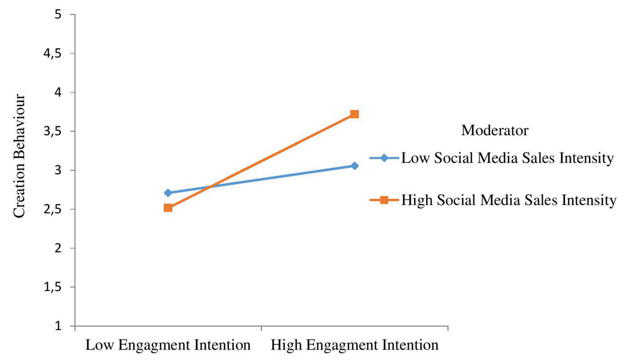

FIGURE 5 | Interactive effects of engagement intention and social media sales intensity on creation.

intention and consumers' creation behaviour will be stronger. As shown in **Figure 2**, the interaction between engagement intention and social media sales intensity predicted consumers' creation behaviour significantly ($\beta = 0.213$, $t = 3.921$, $p < 0.01$), which supports H11. We also plotted the interaction in accordance with Aiken and West's (1991) and **Figure 5** indicates that higher levels of social media sales intensity, the association between engagement intention and consumers' creation behaviour grows stronger, confirming H12.

DISCUSSION AND CONCLUSION

Based on the SOR theory, this research unfolds the mechanism through which SMMA affects engagement behaviour. This study's findings confirm the hypotheses related to the links between SMMA, SMIS, engagement intention, engagement behaviour, and social media sales intensity. According to the study findings of the time-lagged design, it is found that SMMA are positively related to engagement intention; engagement behaviour is positively related to engagement behaviour. Moreover, social media sales intensity strengthens the link between engagement intention and engagement behaviour.

This research investigates SMMA and SMIS with the moderated role of social media sales intensity among engagement intention and engagement behaviour. Engagement intention is a significant predictor of engagement behaviour, and social media sales intensity is significantly related to engagement behaviour in all three dimensions, i.e., consumption, contribution, and creation. The study found a significant positive contribution of all dimensions to engagement intention. This study applied the SOR model to understand SMMA, social media search information, engagement behaviour with engagement intention, and social media sales intensity as a moderated effect. The findings show that stimuli (SMMA and SMIS) cause an organism (engagement intention), in turn, create a response (engagement behaviour).

The results suggest that SMMA is a significant predictor of engagement intention, and this finding is consistent with that (Syrdal and Briggs, 2018). The study proposed that engagement is considered a state of mind and is treated separately from liking and sharing content. The results of the study also suggest that SMISs significantly predict engagement intention. This result is consistent with Jacobsen and Munar's (2012) study in which it was suggested that SMIS matters, but it does not predict the actual online shopping; it is just the intention to search for information among various alternatives. Engaged behaviour demonstrates that the companies involved in engaged opportunities give more importance to customers and respond to their needs (Heaphy and Dutton, 2008).

Implications of the Study

Implications for Research

First, SMMA and engagement behaviour knowledge were extended by applying the SOR model. Second, engagement behaviour in terms of consumption, contribution, and creation association was examined with engagement intention. Third, the moderated effect of social media sales intensity was examined between engagement intention and engagement behaviour. Fourth, engagement intention and behaviour are most often checked in the fashion industry, but this study examined its effects on online shopping websites.

This study explicitly examined the role of environmental stimuli (SMMA and SMIS) in the development of organismic reactions (engagement intention), which shapes engagement behaviour. Using the SOR theory to explain the linkage between current research variables was also a contribution. The findings of this study provide strong evidence for SOR in the context of engagement behaviour. The application of SOR in such a context is rare in the literature, despite SOR being used in several other contexts such as retailing, the hotel industry, and organisational behaviour (Kandampully et al., 2018; Mehmood et al., 2020; Nunkoo et al., 2020). This study has several practical implications. Regulatory institutions provide insight into the mechanisms of SMMA and engagement behaviour. To achieve the effectiveness of the SMMA, careful selection of media will be given equal importance, which is appropriate for creating trendiness, personalisation, interactivity, informativeness, and WOM. As companies try to maintain and achieve maximum engagement, media selection will be of valuable importance. Second, SMMA plays a significant role in creating engagement intentions. Careful selection of the media should not be neglected. SMIS significantly influences engagement intention, which gathers and updates the relevant information and is available to all customers. Companies use this promotion technique, such as SMMA, to gain customer attention and maximise sales.

Implications for Practitioners

This study highlights the significance of marketers in giving attention to SMMA, engagement intention, and engagement behaviour. First, marketers should unfold the benefits of SMMA in the current scenario, where it becomes a necessity for all customers. This has become the most interactive, accessible, and appropriate medium for creating eWOM. As highlighted by Chan et al. (2014) and Hollebeek et al. (2016), it generates customer cognition, activation, and affection. Few researchers have recommended that companies engage customers by rewarding them to share their experiences and information on the SMMA (Wang et al., 2012; Sijoria et al., 2018). Moreover, businesses should invest in more personalised predictive recommendation engines for their social networking sites. As a result, such insightful recommendations will help to make consumers feel valued, resulting in a more favourable effective experience. An effective social media marketing strategy encourages customers to share product information of their own will through different activities like interaction and personalisation. Marketing managers may increase trendiness by routinely updating their social media online shopping sites to reflect the most recent news and offerings, so attracting customers' attention and favourable emotions to the social media forums (Cheung et al., 2020).

Based on these findings, it is predicted that customers use SMMA extensively and are highly influenced by social media in the engagement process. Companies involved in SMMA can enhance sales intensity if they properly utilise the channels. SMMA and search information are becoming popular for evaluating products and services. SMMA is becoming an effective tool, as more customers are engaged with the company by utilising this resource. Companies should develop marketing strategies related to SMMA to increase consumption, contribution, and creation. Customers who use social media to check the posts, pictures, reviews, and ratings of a specific product or service increase sales, so it is recommended that those companies update and inform customers regularly to build relationships with customers through online communities. Companies must develop blogs, product review websites, or fan clubs to increase their image excellence *via* WOM.

E-commerce firms are putting efforts to increase online engagement behaviours, but they are unclear which medium provides specific kinds of engagement. Companies should devote their efforts to understanding the SMMA's effect on engagement behaviour. Thus, personalisation, informativeness, and WOM, the dimensions of which increase maximum engagement, should be identified. Engagement behaviour is the desired outcome of a company, so managers should not underrate SMMA. Managers should devote considerable time to analysing which SMMA evokes the maximum engagement behaviour. Most companies are devoting time to creating platforms for customers on social media, but there is still a need to specify these efforts. This research also provides managers with the direction to measure engagement behaviour with the firm's offering and activities on SMMA. Managers should focus on a blend of information exchange media and stores to promote engagement behaviour at high levels.

Limitations

Time-lagged data were used in this study, which typically controls the common method bias (Podsakoff et al., 2012; Li and Mehmood, 2019; Mehmood et al., 2021a,b; Khan et al., 2022); hence, common source and common method biases were not major problems. Despite these advances, there are a few limitations of our study. First, the study's data are from a single industry type in Pakistan and cannot be generalised to other sectors or national contexts. Second, this study included only Pakistani participants. The findings may be applicable to consumers in other collectivist nations, although this generalisation requires validation. Thus, future cross-cultural studies (Li et al., 2017, 2019; Jabeen et al., 2020; Mehmood et al., 2020, 2022; Alkatheeri et al., 2021; Mehrajunnisa et al., 2021; Müller et al., 2021) on Western and Eastern cultures might be interesting.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

YS and KM have an equal contribution, conceived the idea and helped in writing the introduction and literature review. HR and YI collected the data. AX and RS wrote the discussion, conclusion, and implications of the study. YW helped in writing the literature review. All authors have read and approved the final manuscript.

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